JULY 1950

PIT AND QUARRY

New Plant of the Halliburton Portland Cement Company at Corpus Christi, Tex.

22nd Annual Cement Mills Number

First Installment of World Cement Industry Review • Loading the Rotary Kiln • Plant Improvements at Volunteer and Canada Cement, Montreal • Reports of N.L.A. and N.I.S.A. Conventions

For Editorial Index to Volume No. 42, see page 258

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The ad that failed

...and why!

Proving that Mack trucks outlast them all!

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

8345

Thanks—but no! "Our fleet comprises 235 motor vehicles and includes 136 Macks, several of which have passed the fifteen-year mark . . . one is in its twenty-fifth year. All are registered and operating profitably. We can see no reason to retire such trucks at this time." C. W. HALL, PRESIDENT, C. E. HALL & SONS, SOMERVILLE, MASS.

Not trading! "My 1923 Mack still does its share to gross me $3,000 per year in the moving business—and I have spent less than $100 in repairs on this truck in the last 20 years. Obviously, I am not interested in trading." I. V. ASHBY, ASHBY HOUSE MOVING CO., OKLAHOMA CITY.

Will keep! "Our 1934 Mack is still giving good service—it is the oldest of our 30 Macks but still good enough to keep." CLARENCE J. SMITH, SMITH BROS. TRUCK CO., LOS ANGELES, CALIFORNIA.

Still too good! "With reference to your proposal to give us an extra allowance on our Bulldog Mack purchased in 1922—please be advised that this truck is too good to trade in." J. KOLKO, SPEEDWAY WRECKING CO., CHICAGO, ILL.

Trade? not yet! "Forty-two of our trucks are Macks—some of them 27 years old. They outlast any other make and have proved very economical to operate. Not trading yet." JOSEPH CAPECCI, PHILADELPHIA, PENNA.

Another Goodyear First—

A new cord material that gives V-Belts

40% higher HP ratings Highest shock-load resistance without excessive stretch

HEART of these belts is a new, chemically produced fiber that has nylon's *strength, without its stretch.* This newly developed material is the reason why HY-T Multi-V-Belts boast horsepower ratings 40% above ordinary belts.

That means you can handle heavier loads with fewer belts—7 HY-T belts will walk away with a load that requires 10 regular belts! What's more, they're built to take heavy shock-loads in stride—give outstanding flex-life on *all* diameter sheaves, and at all speeds within Goodyear or RMA recommendations.

Now V-Belt users everywhere can get the ideal combination of characteristics for heavy-duty, high-shock-load service with Goodyear's NEW HY-T belts. Designed to meet the most exacting requirements—tested on hundreds of tough drives—these belts are now in production and will soon be available in standard sizes through your nearest Goodyear Industrial Rubber Products Distributor.

Ask the G.T.M.—Goodyear Technical Man—or your nearest Goodyear Distributor to show you how to end your drive problems with this new belt that has the highest HP rating and longest flex-life of any fiber construction belt on the market. Or write Goodyear, Akron 16, Ohio.

You get all nine with Goodyear's NEW HY-T Multi-V-Belts

HIGHER HP RATING
REDUCED STRETCH
LONG FLEX-LIFE
HIGH SHOCK-LOAD RESISTANCE
COOL RUNNING
OIL RESISTANCE
RESISTS AGING
STATIC CONDUCTION
MILDEW RESISTANCE

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GM-Specified HY-T MULTI-V-BELTS
cross-section A, B and C sizes up to 120"
A—single plane of synthetic cords for greatest flexibility
B—cushion section of rubber
C—notches close rounding pulleys for more pull; open between pulleys for cool running
cross-section A, B, C, D and E sizes 120" and longer
a—multiple-ply synthetic-cord load carriers for maximum strength and shock resistance
b—fabric reinforced body to minimize vibration on longer drives
A
B
C
a
b

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

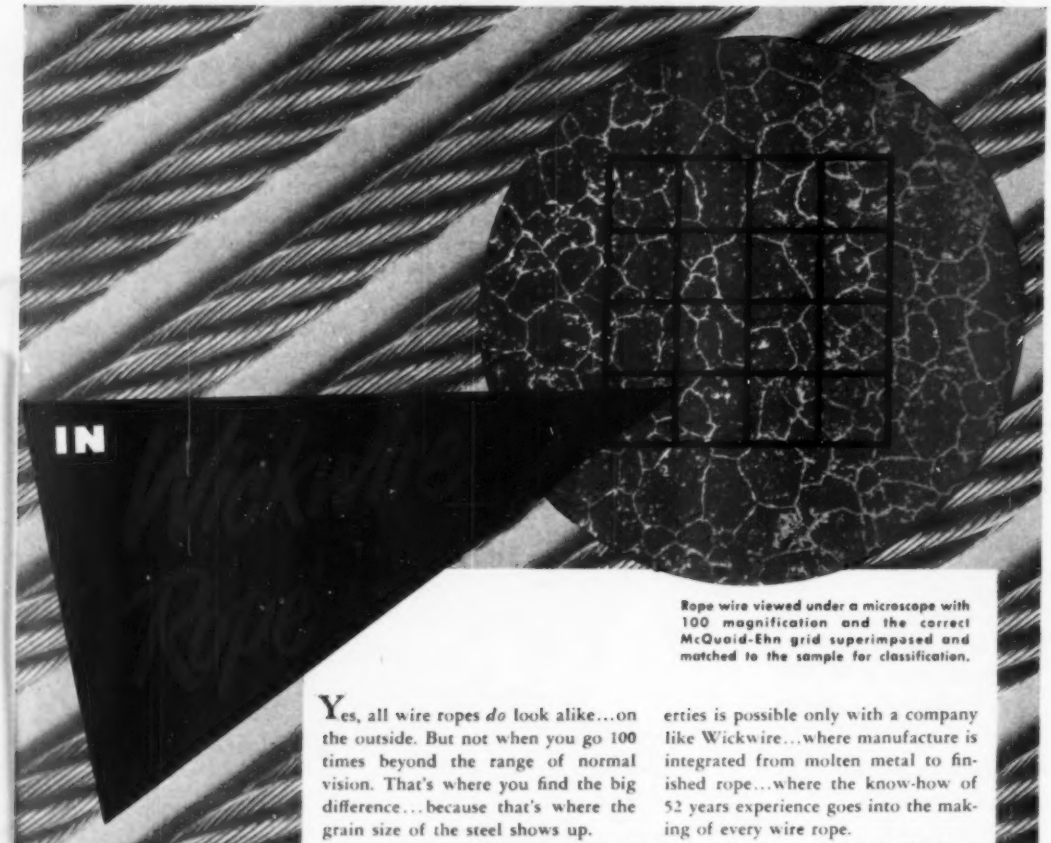
GOODYEAR

THE GREATEST NAME IN RUBBER

HY-T-T.M.
The Goodyear Tire & Rubber Company, Akron, Ohio

PIT AND QUARRY, July, 1950, Vol. 43, No. 1. Published monthly by the Complete Service Publishing Company, 528 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $2 additional for each year. Single copy 50 cents. Entered as second-class matter February 28, 1933, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

ALL ROPES *look* ALIKE... but THERE'S MORE THAN MEETS THE EYE...



Rope wire viewed under a microscope with 100 magnification and the correct McQuaid-Ehn grid superimposed and matched to the sample for classification.

Yes, all wire ropes *do* look alike...on the outside. But not when you go 100 times beyond the range of normal vision. That's where you find the big difference...because that's where the grain size of the steel shows up.

Steel used for Wickwire Rope is measured for proper grain size by the exacting McQuaid-Ehn test. Typical samples are carburized to 1750° F., cooled slowly, polished and etched; then examined under a high-powered microscope for the proper matching of a McQuaid-Ehn grid to the size of the crystals. Thus, we make sure that steel going into Wickwire Rope conforms to the definite grain size that will give longest, most satisfactory service.

Such quality control of basic properties is possible only with a company like Wickwire...where manufacture is integrated from molten metal to finished rope...where the know-how of 52 years experience goes into the making of every wire rope.

It explains, too, why Wickwire Rope always gives you uniform performance, enduring reliability and longer, more economical service on the job. For the *right* rope for your particular requirements, see your local Wickwire distributor. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed. For your free copy of "Know Your Ropes" write to: Wire Rope Sales Office, Wickwire Spencer Steel Division of C.F.&I., Palmer, Mass.

WICKWIRE ROPE

CF&I 7 SUBSIDIARIES

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. **EXECUTIVE OFFICE**—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.)•Boston•Buffalo•Chattanooga•Chicago•Denver•Detroit•Emlenton (Pa.)•Philadelphia•Tulsa•Fort Worth•Houston•New York

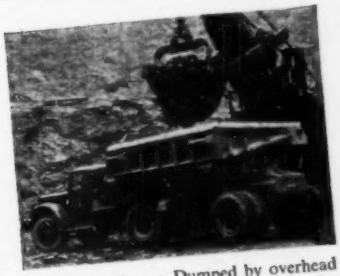
PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

NO HOBSON'S CHOICE

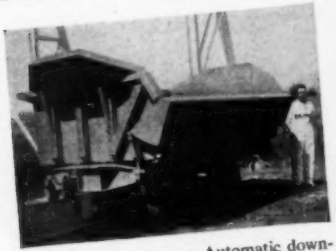
This advertisement, reproduced from Pit & Quarry Handbook, illustrates a very important feature of EASTON's service to the quarry industry—variety of choice. A wide choice of different types of dependable, job-proved quarry transportation equipment helps to protect your haulage investment.

Trailer • Doorless Pan • World famous two-way side-dump for low cost quarry hauling. All-welded. Dumped by *Easton* automatic overhead hoist. Capacities 15-22 tons.

Trailer • Drop Door • Hydraulic dump or overhead hoist. Automatic down-folding door. All-welded. For versatile earth, rock and ore hauling. Capacities to 40 tons.



Trailer • Lift Door • Dumped by overhead hoist. Side door is lifted to raise body for dumping. All-welded. For heavy duty in mines and quarries. Capacities to 40 tons.



Quarry Car • Drop Door • Automatic down-folding door. Rugged, all-welded construction for mine and quarry service. Timken bearings. Capacities to 10 cubic yards.

DOORLESS PAN

LIFT-DOOR

DROP-DOOR

3 BASIC SIDE-DUMPS

TRAILERS or TRUCK BODIES or QUARRY CARS

All three standard basic types are available in a wide range of capacities for earth, rock and ore moving services. EASTON also builds many special smaller units, including skip cars, gravity dump cars, and granby cars. A free transportation survey by experienced EASTON engineers assists the user in selecting the most efficient, most economical type of equipment for his particular requirements. *EASTON trailers and truck bodies are used with all makes of commercial and off-highway trucks and truck tractors.* For prompt attention direct all inquiries to:

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

Truck Body • Doorless Pan • Two-way reversible side-dump body. All welded. Hydraulic or overhead hoist. For rugged, versatile quarry service. Capacities to 30 tons.

Truck Body • Drop Door • Hydraulic dump, automatic down-folding side door. All-welded. A versatile unit for earth moving, mining, quarrying. Capacities to 30 tons.

Quarry Car • Doorless Pan • The world-famous *Easton-Phoenix* two-way side-dump quarry car. All-welded construction. Timken bearings. Capacities to 10 cubic yards.

Truck Body • Lift Door • Bale lift door, lifted by overhead hoist, raises body for dumping. Rugged, all-welded for mine and quarry duty. Capacities to 30 tons.

EASTON *Side-Dump*

TRAILERS • TRUCK BODIES • QUARRY CARS

B-1041-A

NEEDS NO MUD PROTECTION . . .

GARDNER-DENVER VP4 SUMP PUMP

Mud can't hurt the Gardner-Denver VP4 Pneumatic Sump Pump. Designed on a new principle of TOP-SUCTION—the VP4 can't "dig in"—won't bury itself in a muddy sump—won't block inlet flow.

Top-suction also eliminates one of the most common causes of pump failure—breaking of the pump shaft seal because of water pressure. *Top-suction* keeps all dirt and water away from the oil seal, bearings and air motor—actually pulls lubricant into the seal.

Write for complete information about this *better* sump pump.

GARDNER-DENVER

Since 1859

Gardner-Denver Company, Quincy, Illinois

In Canada:
Gardner-Denver Company (Canada) Ltd., Toronto, Ontario

You can't keep up with a GOOD ROCK SHOVEL!

Even the advertising can't keep up with it. Before the reproduced ad had been completed and run, Bryan Rock & Sand Co. of Raleigh, N. C. had eight more Northwests in service.

Northwest owners have found that when you begin with a real rock shovel you finish the job on time. That is why one out of every three Northwests sold is a repeat order in the hands of a responsible contractor.

Northwest advantages and Northwest design make possible the kind of service you are looking for. Check with Northwest users. Ask about the "Feather-Touch" Clutch Control, Uniform Pressure Swing Clutches, the Cushion Clutch, the Northwest Dual Independent Crowd, Northwest Steering and other features that make upkeep costs low and assure high output. Talk to our sales agent and get full details. If you have never had a Northwest you'll find that your first Northwest will be our best salesman.

NOW it is 13 NORTHWESTS for BRYAN ROCK & SAND CO. Raleigh, N. C.

NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street
Chicago 3, Illinois

NORTHWEST

Convertible for any Mining Material Handling or Excavation Problem

YOU WOULDN'T STARVE AN ELEPHANT...

TO SAVE PEANUTS!

No, and it's just as unsound to risk downtime and damage to expensive machines for the sake of saving "peanuts" on lubricant costs! For lubrication is not just "oils and greases"... it's also knowledge of your machines, the right lubricants to use, and where and when to use them.

That's why you save in so many ways with *Socony-Vacuum Correct Lubrication*... a custom-made program of lubrication for your particular equipment and operating conditions that pays off in greater efficiency, faster work-progress, lower maintenance costs, and—ultimately—lower lubrication costs.

For the *genuine* savings of Correct Lubrication, call your Socony-Vacuum Representative.

Here's Practical Help for Contractors . . .

Socony-Vacuum gives you . . .

- Help on all maintenance problems.
- Tested lubrication schedules.
- Advice on correct application of lubricants.
- One source of supply.
- Simplified inventory—with . . .

1. **DELVAC OILS**—for gasoline, automotive-Diesel engines.
2. **MOBILUBE GX**—for all enclosed gears—manually operated transmissions and final drives.
3. **MOBILGREASE MP**—for all chassis parts and engine accessories.

SOCONY-VACUUM

CORRECT LUBRICATION

for Contractors

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL CO., INC.
MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

Loading 200 yards of shot-rock hourly

Two hundred cubic yards of shot-rock per hour — 2000 yards per day — this T7 TRAXCAVATOR is loading, directly from the blast area.

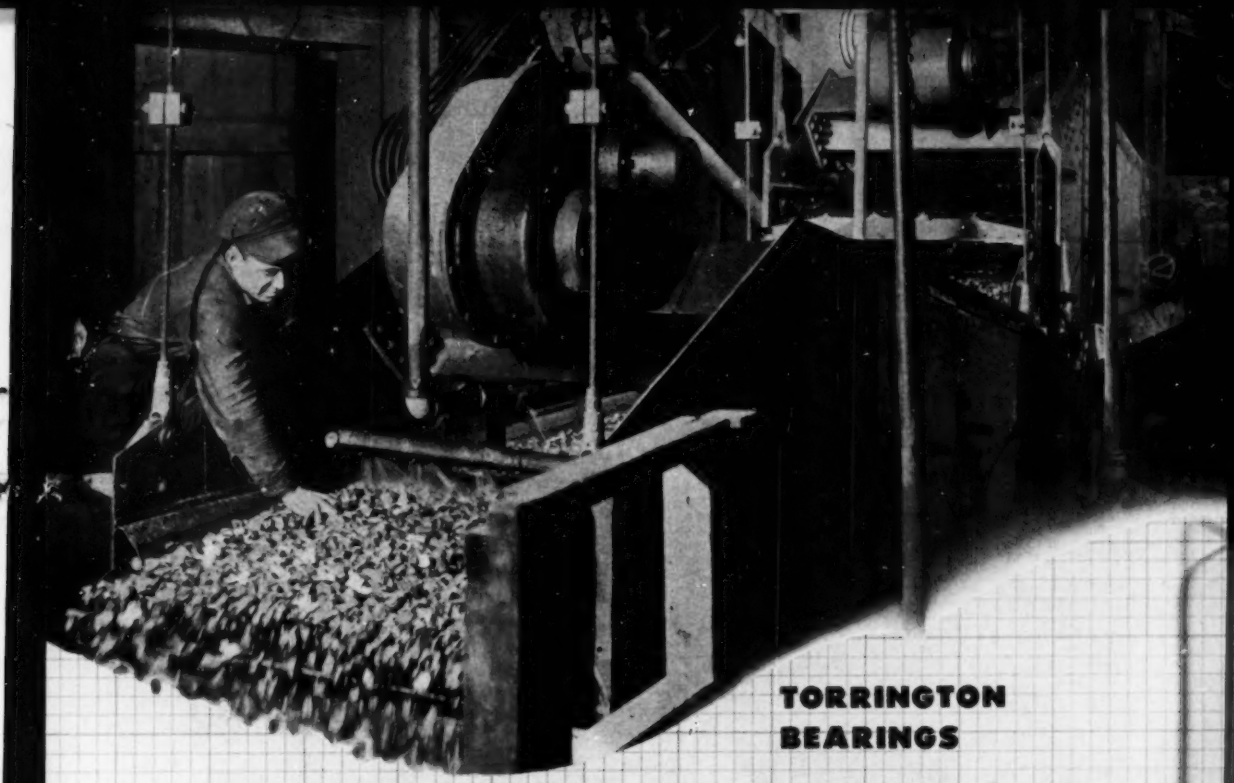
The T7's traction turns its 81 heavy-duty horsepower into sustained "crowd" — to fill its bucket without time-wasting, unproductive "tries"! This big unit's fast and positive mechanical hoist is dependable in all weather; with V-belt drive heavily armored against rock damage.

Mobile and responsive, the powerful T7 has travel speeds up to 6 miles per hour to suit any quarry loading, stock-piling or overburden stripping situation. Behind its production advantages, is unit engineering — strength and wear-resistance to match the "Caterpillar" Diesel D7 Tractor, for long life and low upkeep.

Big TRAXCAVATORS, the T6 and the T7 are unique for many-purpose usefulness and large capacity, in quarries, clay and gravel pits. One of these versatile units fulfills the money-making functions of several limited-duty machines!

The 5 Models (½ to 4 cubic yards capacity) make TRAXCAVATOR the only tractor-shovel line from which to choose the one that fits your job and purpose. For full details, see your TRACKSON-"Caterpillar" Dealer, or write TRACKSON COMPANY, Dept. PQ-70, Milwaukee 1, Wisconsin.

TRAXCAVATOR® *The Original Tractor Excavator*



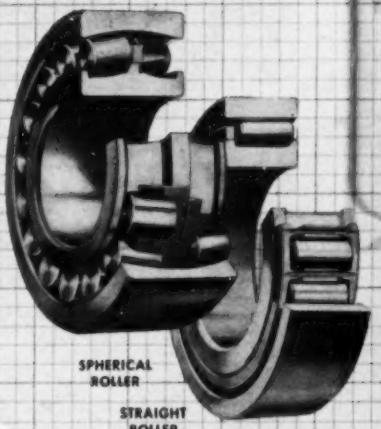
TORRINGTON BEARINGS

pass a tough screen test

Vibrating screens give a design engineer a tough problem in bearing selection. Satisfied with nothing less than the best screen performance, Allis-Chalmers engineers have devoted years of research in close cooperation with bearing manufacturers to develop precision bearings ideally suited to each specific screen application.

For example, in many Allis-Chalmers Ripl-Flo screens, two Torrington Spherical Roller Bearings are used to support the accurately-balanced eccentric shaft that imparts a perfect circle vibratory motion. Many Allis-Chalmers Low-Head screens utilize four Torrington Straight Roller Bearings to support the counterweighted shafts providing the straight-line vibratory motion. The results are high performance and low maintenance in both models.

It may pay you, too, to consult our engineers' special knowledge of all major bearing types in connection with *your* friction problems.



SPHERICAL ROLLER

STRAIGHT ROLLER

THE TORRINGTON COMPANY

South Bend 21, Ind. • Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON BEARINGS

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • NEEDLE • BALL • NEEDLE ROLLERS

judgment

snap judgment *can pay off . . . but usually it's an expensive luxury. When considering a better looking and more efficient container for your product, we know you'll want to give this SALES STIMULATING subject a long, hard look. Your Chase Salesman is thoroughly qualified to analyze your requirements. He is supported by engineering, design, and research data that can be quickly brought to bear on your specific problem. Why not make it a point to check with him today?*

bags for all industry and agriculture...

- cotton bags of all kinds
- Topmill burlap bags
- paper & Multiwall bags
- Saxolin open mesh bags
- combination bags, liners, and specialties.

SINCE 1847

CHASE BAG CO. GENERAL SALES OFFICES, 309 WEST JACKSON BLVD., CHICAGO 6, ILL.

BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MEMPHIS • BUFFALO • ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE
PITTSBURGH • KANSAS CITY • LOS ANGELES • MINNEAPOLIS • GOSHEN, IND. • PHILADELPHIA • NEW ORLEANS • ORLANDO, FLA. • SALT LAKE CITY
OKLAHOMA CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS • CHAGRIN FALLS, O • HUTCHINSON, KAN. • CROSSETT, ARK • SAN FRANCISCO

Superior Stone Company Reports
J & L JALLOY Heat-treated Steel
SAVES $200 PER TON installed

J&L STEEL

Center—*Superior Stone Company's Red Hill Quarry, showing screening, crushing and loading units.*

Left and right—*Jalloy heat-treated plates used extensively at Red Hill in chute liners and truck bottoms.*

Heat-treated Jalloy Chute and Truck Liner Plates Give 3 Times Longer Service at Superior's Operations

Superior Stone Company is cutting maintenance costs and increasing service life of equipment by standardizing on J & L JALLOY heat-treated plate for chute and truck body plates.

Typical of Superior's eight operations in Virginia and North Carolina is the large Red Hill, Virginia, quarry. Records at Red Hill show that J & L heat-treated Jalloy has a service life *generally three times longer than mild steel.* This means that for every ton of heat-treated Jalloy Superior Stone Company uses to replace mild steel, $140.00 is saved in cost of steel and $60.00 is saved in man hours spent for maintenance of chutes and truck bodies. **A total savings of $200 per ton of Jalloy installed.**

The result—J & L Jalloy is now installed as side and bottom liners in all chutes at Red Hill Quarry, in truck bodies and in several other miscellaneous applications.

Manufacturers and maintenance men alike have found that a yield strength 4 times that of mild steel and a Brinell hardness 4 times as great make heat-treated Jalloy an ideal steel for use in such applications as — Bulldozers — Scrapers — Rock Crushers — Shovel Buckets — Dump Cars—Truck Bodies—Chutes and Sand Blast Equipment.

If abrasion and impact are limiting the life of your equipment—and causing high maintenance costs—why not write for the booklet, "For Longer Wear, Less Repair"? It will give you the facts on J & L heat-treated Jalloy and how others are saving money with this modern mining and quarrying steel.

Jones & Laughlin Steel Corporation
465 Jones & Laughlin Building
Pittsburgh 30, Pa.

Please send me a free copy of your booklet, "For Longer Wear, Less Repair—Jalloy—J & L Special Alloy Steel."

Name_____

Company_____

Address_____

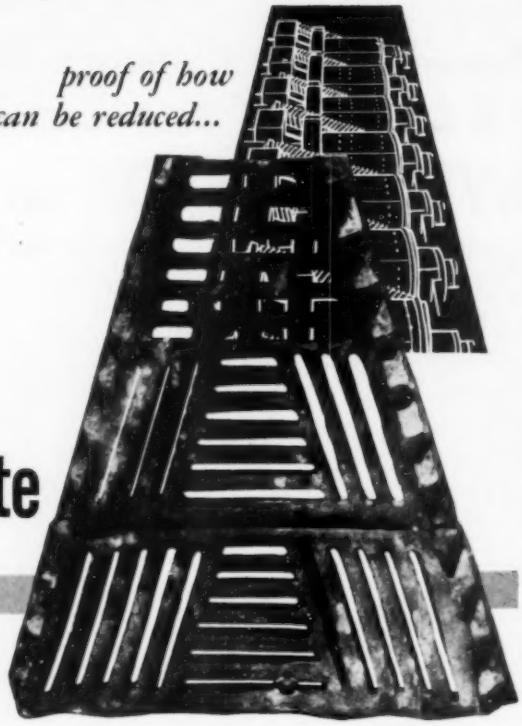
JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L *manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

proof of how milling costs can be reduced...

this AMSCO® Grate has milled 193,797 tons



An actual example of how AMSCO Grates last longer, reduce shutdowns and increase milling profits.

Equally Big Savings On Liners, Too! Recent production figures on Amsco double-wave Liners in a mill grinding copper ore: 667,308 tons ground . . . at a liner cost of about a half-cent per ton! *It will pay you to investigate the long, low-cost service of Amsco Liners!*

Find out more about Amsco Liners and Grates

Be sure to ask for a copy of Bulletin 449-ML. Describes the characteristics of Amsco ball mill alloys; gives additional facts on dollar-saving installations. Free copy on request.

Here's an actual photograph that proves an important, profit-building point to users of ball mill equipment . . . *the real cost of liners and grates is the actual service cost.*

This Amsco grate has milled 193,797 tons . . . compared with just 113,000 tons for a previously used hardened steel grate which ran under identical conditions. And, during this period of 72% greater tonnage milled, *the Amsco grate required no down-time for repair.* The previously used grate started to crack at 50,000 tons—required many shutdowns for plugging holes.

Because of heavy impact, this particular Amsco Grate was made of austenitic chromium-manganese steel—one of three Amsco alloys developed for specific conditions of impact and or abrasion. These Amsco liner and grate alloys can result in big savings on milling costs. Amsco Engineers are fully qualified to make alloy recommendations based on your operating conditions—*write today for the name of the Amsco engineer nearest you.*

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
396 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

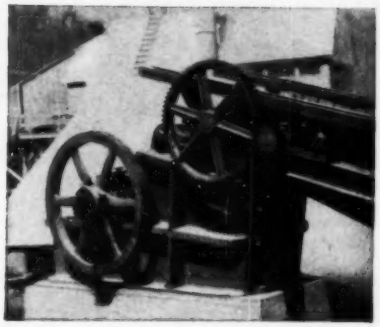
Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

Traylor

WRITE FOR BULLETIN 3121 TODAY

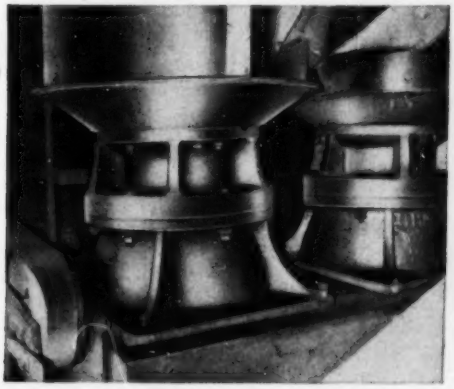
MACHINERY FOR CEMENT PLANTS

. . . designed for lower cost operation, greater dependability and closer product quality control.

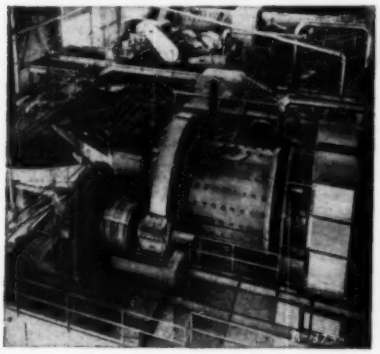


Lesser volumes can often be most profitably crushed with a Traylor Jaw Crusher such as the Type H shown here with a Traylor All Steel Apron Feeder to provide absolute feed control.

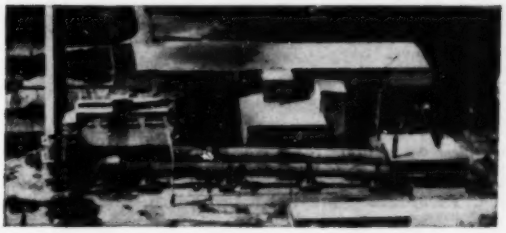
For Primary Crushing in huge quantities, a favorite item of equipment is the Traylor Bulldog Gyratory Crusher like this 54" model which Traylor built for a cement plant in Montreal, P.Q. and one in Great Britain.



For Reduction Crushing, the Traylor TY, with its exclusive bell head and curved concaves, has an extremely favorable output-to-horsepower ratio. This is one of a pair employed in a California cement plant.



Traylor Ball Mills were installed for both raw and finished grinding when this plant was built in 1948 at Portland, Colorado. This company has a total of 27 Ball Mills in operation at plants in Colorado, Alabama and Utah.



This picture shows a 9'6" x 250' Traylor Rotary Kiln and Tube Cooler operating in a modern cement plant at Okay, Arkansas. A new plant built by this Company includes four 10' x 400' Traylor Rotary Kilns.

TRAYLOR ENGINEERING & MANUFACTURING CO.
167 Mill St., Allentown, Pa.

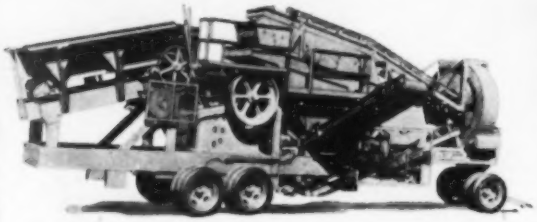
Sales Offices: New York, N. Y., Chicago, Ill., Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

Traylor

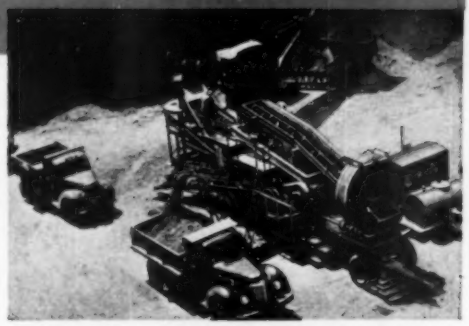
Rotary Kilns, Coolers and Dryers
Grinding Mills · Crushing Rolls
Jaw, Reduction and Gyratory Crushers

A "TRAYLOR" LEADS TO GREATER PROFITS

4 TOP PRODUCERS THAT INVITE COMPARISON



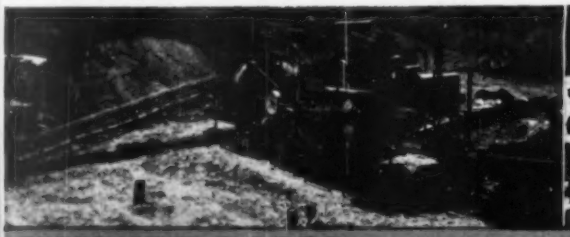
1 TwinDual Pacemaker Rock Plant

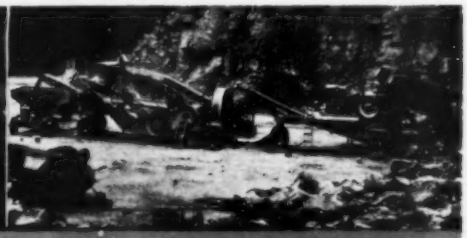


2 TwinDual Gravel King—three stages of crushing, two screens for pits with large boulders

3 TwinDual Master Gravel Plant—double the output of conventional two-stage plants of comparable size and weight

4 TwinDual Secondary with 546P Primary. High capacity with two portable units for quarry operation





UNIVERSAL'S TwinDual PLANTS FOR ROCK AND GRAVEL

Out in front! Universal TwinDual Plants are breaking production records and cutting costs per ton on finished aggregate.

Universal "Stream-Flo" engineering does it with the TwinDual Method—the modern system of crushing and screening that gives three full stages of reduction with only two crushers. You get more production, less jaw and roll shell wear, longer life, less maintenance.

Before you make an investment in a crushing, screening and loading plant for rock or gravel investigate the profitable bonus you get with a TwinDual installation. Compare TwinDual Plants with the field. Get the facts now.

How many crushers do you need for 3 full stages of reduction?

The TwinDual Method does it with two—
First Stage—Jaw Crusher
Second and Third Stages—TwinDual Rolls

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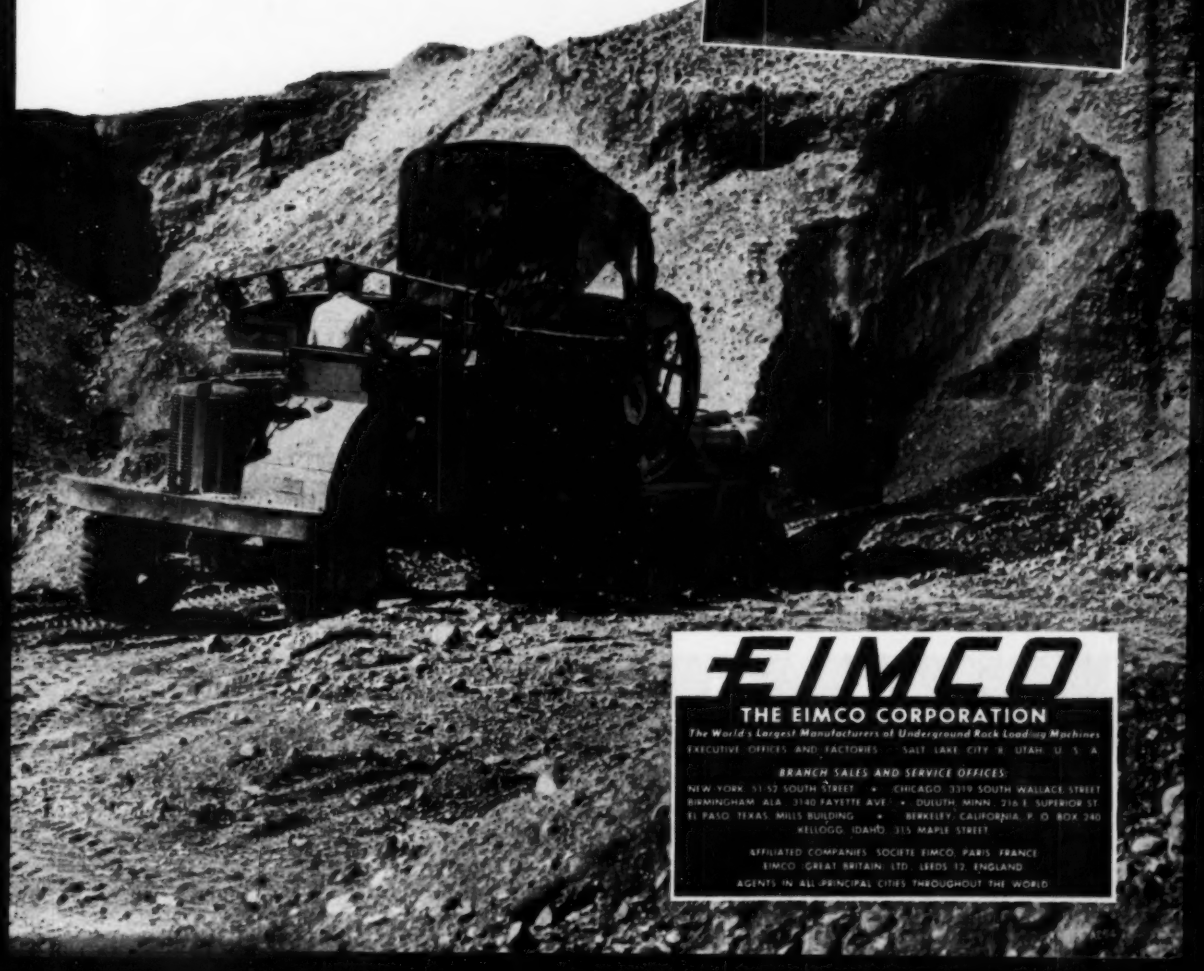
8 Yards Per Minute

The Eimco 104 RockerShovel, equipped with a two yard sand and gravel bucket, averages 8 yards per minute. The 104 is a fast, efficient, heavy-duty loader for rock, sand, gravel or other materials.

Available with either electric or Diesel power, the 104 is delivered ready to operate. The operator controls the bucket with one simple convenient handle, and may bring the bucket up slowly to dribble the load into small trucks or fast to throw the load back into long trucks. For low-cost, dependable loading write for Bulletin L1021 on Sand and Gravel or see your Eimco "Caterpillar" Dealer.



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The World's Largest Manufacturers of Underground Rock Loading Machines

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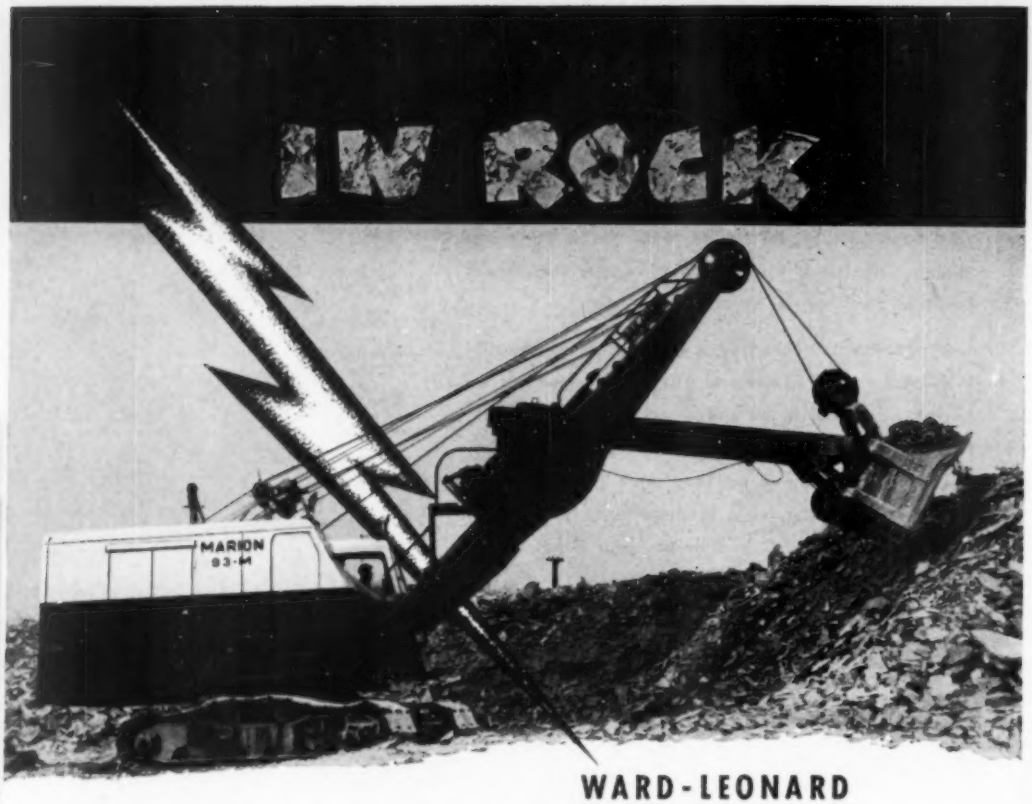


WARD-LEONARD

MARION 93-M ELECTRIC

The new MARION 93-M Ward-Leonard Electric shovel digs rock with smoothness you'd never expect from a 2½-3 cu. yd. machine.

There's no jerking—no hesitating—no "stuttering" when the dipper comes up through a rock pile. There is power to spare, applied so smoothly that there is no machine strain or breakage.

This is the kind of smoothness that pays off in longer machine life, greater daily yardage and greater dependability.

From its long, wide, steady crawlers to the big, reversible dipper teeth, here is a MARION designed and built for service in rock digging.

The 93-M is built to MARION standards of quality that mean year-after-year dependability and true, long-range economy. It is backed by 66 years of shovel design and manufacturing experience.

Call your nearest MARION representative, or write to the factory.

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

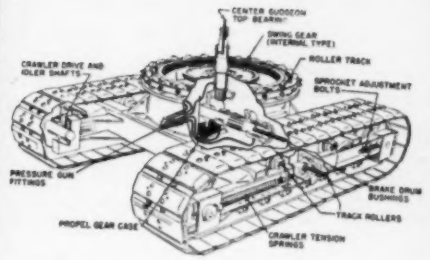
Offices and Warehouses in all Principal Cities • Established 1884

Best-Telling Book

CONTENTS:

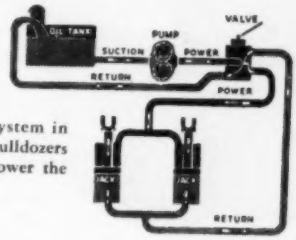
WHAT LUBRICANTS
FOR WHAT APPLICATIONS
—AND **WHY**

YOUR TYPE of construction equipment—engines included—is plainly, soundly covered in this book. You'll be able to judge for yourself which types of lubricant best suit various machines and conditions. You can make your own point-by-point check-up on the complete line of Cities Service lubricants—engineered in types and grades sure to be more than a match for fierce loads, weather and terrain. The performance records prove how sharply maintenance costs go down... how steadily grueling schedules are met... with Cities Service lubricants on the job. Call the nearest Cities Service office for competent aid, or write us direct.



"FIG. 23

Shows internal type open gears of swing rack and one method of lubricating trunion and other shaft bearings... The 'propel' gears are enclosed and oil lubricated. The crawler track and other parts lubricated through pressure gun fittings require grease. See lubrication chart for proper type and grade..."



"FIG. 33

Hydraulic system in use on some bulldozers to raise or lower the blade."

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Multi-Purpose
GEAR OILS
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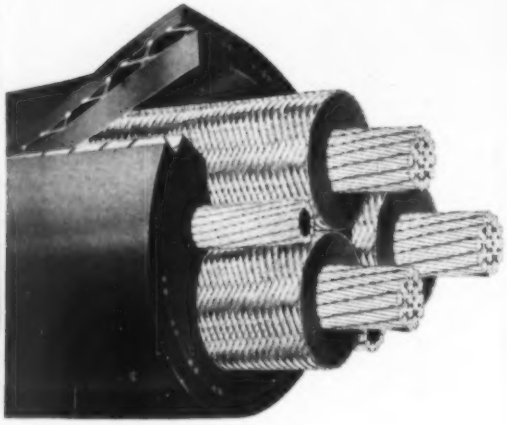
Better for your high-voltage, heavy-duty big shovel jobs!



The newly improved Securityflex* Type SHD is better because it's BUTYL-INSULATED for superior electrical and mechanical characteristics. It stands up better under compression and mechanical abuse, has increased moisture resistance and much higher heat resistance (rated at 80°C.).

Better because it has a new "copper-cotton" combination shield that

means faster, easier splicing
eliminates chafing failures

Better because the patented grounding wires are rubber-cored. That means grounding wires that

will not kink
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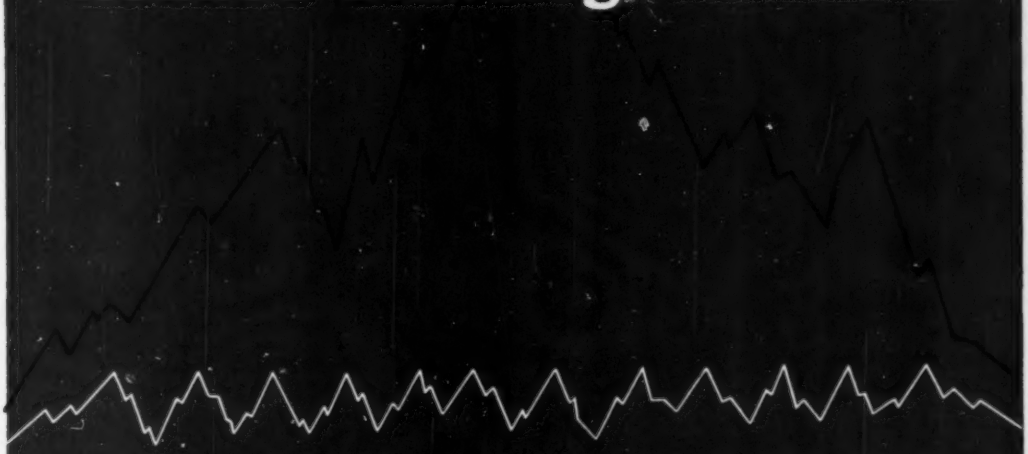
It all adds up to a much more rugged shovel cable. For more information on Securityflex Type SHD, get in touch with your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York. 56314

*Reg. U. S. Pat. Off.

the right cable for the job ANACONDA® WIRE AND CABLE

Reduce Blasting Vibration



and Improve Fragmentation

In many blasting operations you get more work out of your explosives when you use Hercules "No-Vent" Short-Period Delay Electric Blasting Caps. You reduce earth vibrations, noise, backbreak, and endbreak; and at the same time get better fragmentation. You break more material, and break it in better shape for digging, hauling, and crushing. This saves you money at every step in your operation.

A complete series of Short-Period Delays gives twelve closely-timed delay intervals in approximately 400 milliseconds. By various arrangements of these delays, the delay effect is secured in blasts of practically any number of holes.

For details and guidance in using "No-Vent" Short-Period Delays in quarries, open-pit mines, underground mines, coal stripping, and construction, return coupon.

Return Coupon for 12-Page Descriptive Booklet

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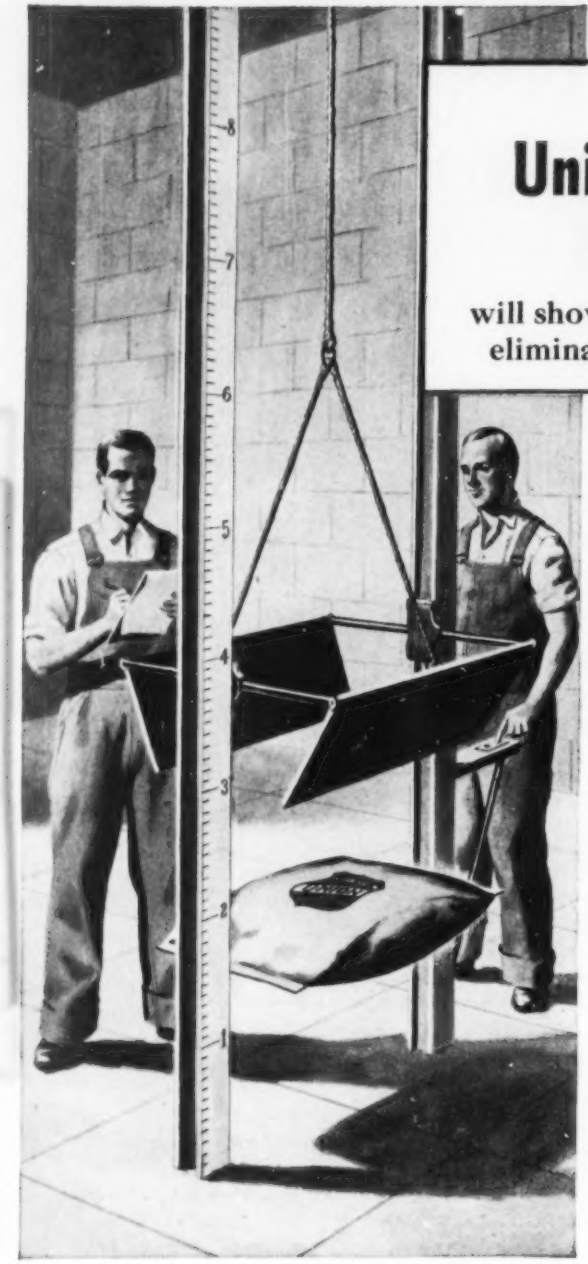

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Union Multiwall Specialist

will show you how quality control eliminates customer complaints!

SHIPPERS of more than 300 different products find Union Multiwall Bags reduce customer complaints and losses in shipping and handling. They are custom-designed with reserve strength for hard knocks.

Continuous testing in Union laboratories leaves nothing to chance. Bag paper is tortured and torn, burst and frayed. Loaded bags are dropped and tumbled and scuffed to discover any weak points, any need for strengthening.

Union Quality Control checks and rechecks every step in the making from timber to finished bag.

This constant checking and testing is a safeguard for every order of Union Multiwall Bags. So when your Union Multiwall representative calls on you, tell him the requirements of your product, its shipping and handling. You can be sure your delivered bags will live up to specifications.

Even if you are now using multiwall bags, your Union representative can give you new ideas on bag construction, packaging and handling that will save you money. So welcome him when he calls!

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User Reports . . .

N-B-M #397 SILVER BABBITT LASTS 5 TIMES AS LONG!

Large Portland Cement Plant used N-B-M Silver Babbitt on Crusher bearings. Result? 400% longer bearing life . . . 30% lower babbitt cost!

The superintendent of this cement plant was —in his own words—"naturally skeptical" when quoted the low original cost of N-B-M #397 Silver Babbitt, compared to a tin-base babbitt then being used. But, later he writes:

"We are happy to say the #397 Silver Babbitt has already given us 4 to 5 times the service of the other metal. We believe the record speaks for itself."

These big savings—*in both original cost and actual service cost*—are possible because #397 Silver Babbitt costs 30% to 40% less than tin-base babbitt—yet has these important features that insure easy handling and better bearing performance:

- **Retains hardness at higher temperatures**
- **Easy to bond**
- **Has high resistance to corrosion**
- **Embeds grit—even at room temperature**

N-B-M Silver Babbitt offers plant and product engineers this real challenge: *chances are that it can make important savings in your plants or products.* Investigate it now—write today for complete information and prices!

This folder gives complete facts . . . Lists physical properties and operating characteristics of N-B-M Silver Babbitt. Engineering Brief gives instructions on preparation of shells for good bonding, and pouring. Be sure to ask for your free copy!

Please send me your free folder on N-B-M Silver Babbitt . . .

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"Parts reach us in a few hours' time"

Arthur R. Alvis, quarry plant owner near Butler, Mo., likes his "Cat" D4 Tractor with Trascavator. "It's easier on dump trucks and keeps the area smooth and clean."

THAT's what Arthur R. Alvis, owner of a quarry near Butler, Mo., thinks of "Caterpillar" dealer service. But it's only one reason why he standardizes with "Caterpillar" power and equipment. He knows that "Cat" machines and engines are quality-built to work together for more production at less cost. "We've gotten along better with 'Cat' equipment than any other we've had," he sums up.

Under severe dust conditions, Mr. Alvis relies on a "Cat" D375 Diesel Engine to drive a Universal Pulverizer No. 4—36" x 26" at his stationary crushing plant. He uses a "Cat" D8800 Diesel to drive a 20" x 26" jaw crusher. And a D8800 self-regulated "Cat" Electric Set furnishes the auxiliary power for his whole plant. "Caterpillar" Diesel Engines deliver bonus power at the lowest total cost. Advanced design and quality materials are part of the answer. But another reason for their long-haul economy is the fact they're *reasonably* rated. Because they don't have to risk a mechanical hernia to produce their hp. rating, frequent overhauls and costly breakdowns are avoided, cutting maintenance costs to the bone.

Mr. Alvis' matched equipment gives him matchless performance in processing lime for farmers in surrounding counties, and rock in road sizes for county townships and contractors. He specializes in surfacing stone, concrete rock, buckshot chips and asphalt mixes. And he knows that his one-dealer "Caterpillar" service will get him quick action any time, anywhere. Why not ask the "Caterpillar" dealer in your territory to show *you* how these power-rated yellow engines and machines can increase your profits?

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

This D375 "Cat" Diesel Engine weathers the severe pounding and dust conditions of quarrying in driving a Universal pulverizer at the Alvis stationary crushing plant. In background, a D8800 "Cat" Diesel powers a Universal jaw crusher. This plant handles 80 tons of agricultural lime or 125 tons of road rock per hour. Other "Caterpillar" equipment on the job, for more profitable production, includes a "Cat" D7 Tractor with 'Dozer to handle overburden, and a "Cat" D4 Tractor with Transcavator for loading rock.

All auxiliary power is furnished by this D8800 self-regulated "Cat" Electric Set. This reliable unit stands by and delivers hour after hour, day after day—powering one 30" and five 24" Universal conveyors . . . a 500-amp. P&H Welder . . . and lights, small tools and screens.

LOOK UNDER THE HIDE

Fuel pumps are "Caterpillar"-designed and "Caterpillar"-built. Made of the cleanest high-chromium, high-carbon alloy steel obtainable, the pump plungers and barrels are diamond lapped. Pumps are heat treated to maximum hardness to give users thousands of hours of trouble-free economical service. There is an individual pump for each cylinder. Pumps are adjustment-free and completely interchangeable. Look under the hide for quality that pays off in performance.

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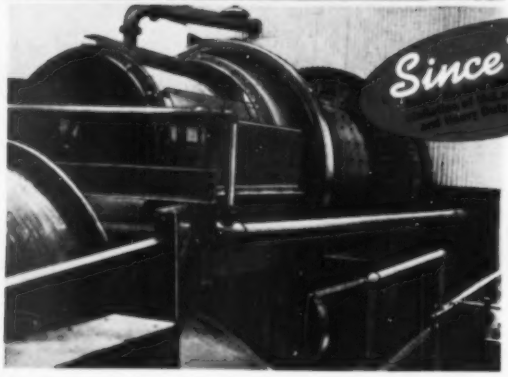
DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



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are counted in DECADES instead of years

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Long service records and amazingly low maintenance costs go hand-in-hand with McLanahan equipment. With the experience of more than a hundred years and an engineering organization which has pioneered many of the modern innovations of the industry—McLANAHAN is your logical headquarters for equipment. Write for specific information on any above or below surface modernization equipment.

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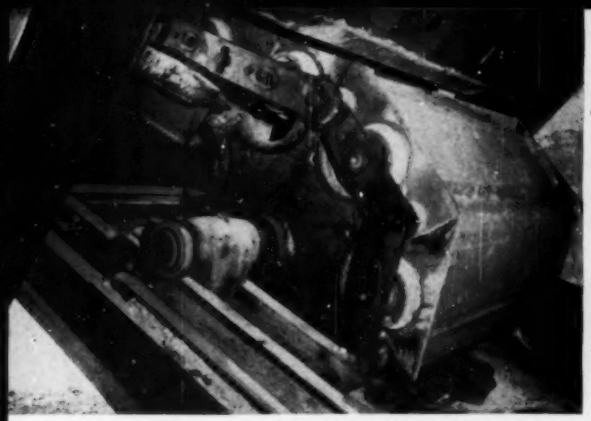
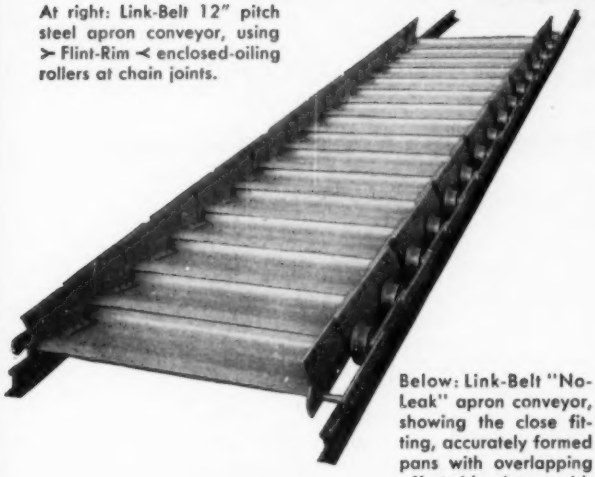
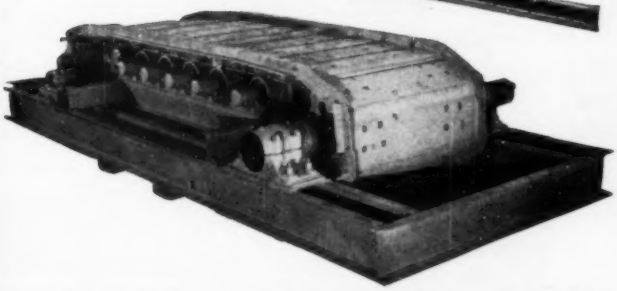


Is your problem the handling of abrasive, lumpy or hot materials?

At right: Link-Belt 12" pitch steel apron conveyor, using ≻ Flint-Rim ≺ enclosed-oiling rollers at chain joints.



Below: Link-Belt "No-Leak" apron conveyor, showing the close fitting, accurately formed pans with overlapping offset side plates welded to the ends.



Above: Link-Belt heavy-duty apron feeder with manganese steel pans, manganese chain, manganese sprockets and supporting rollers. It is particularly suitable for handling large heavy lumps.

A Link-Belt apron conveyor may be the cost-cutting answer

Link-Belt apron conveyors and feeders are not only suitable for the low-cost handling of abrasive, lumpy or hot materials but also for general use when handling materials of other characteristics either horizontally or on an incline.

They resist damage from sudden impact shock and from sharp edges of large lumps; withstand severe loading conditions; and deliver materials in a uniform flow. Installations beneath hoppers or crushers are typical applications when apron conveyors are used as feeders. They handle practically any loose, bulky materials such as ore, coal, steel scrap, castings, foundry refuse, sand, cullet, etc.

Link-Belt apron conveyors and feeders are available in several types and in a complete range of sizes and weights for every service requirement. Get in touch with the nearest Link-Belt office for complete information.

LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities.

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-120,000 GALLONS A MINUTE

Tiger Brand Wire Rope helps keep traffic open in world's busiest harbor

HOIST FOR NOZZLES. Note the smooth reeling and the heavy lubrication for preventing corrosion.

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The two suction nozzles are lowered and raised with American Tiger Brand Wire Rope. As this rope is in and out of salt water constantly, it is heavily lubricated to prevent corrosion. It must also resist vibration and abrasion and have plenty of strength to lift the heavy nozzles.

Tiger Brand Wire Rope and Strand have many other uses on board the Essayons—for hawsers, hoists, boom supports, rigging, guys and mooring lines. Each type is especially designed for its particular use.

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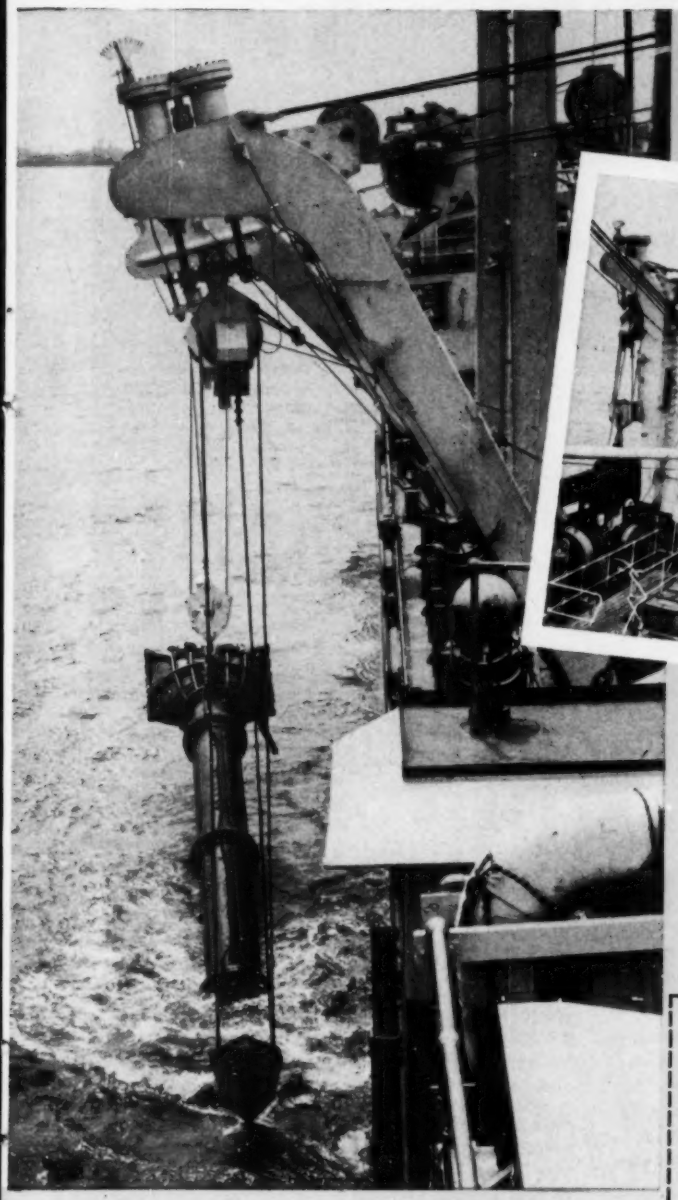
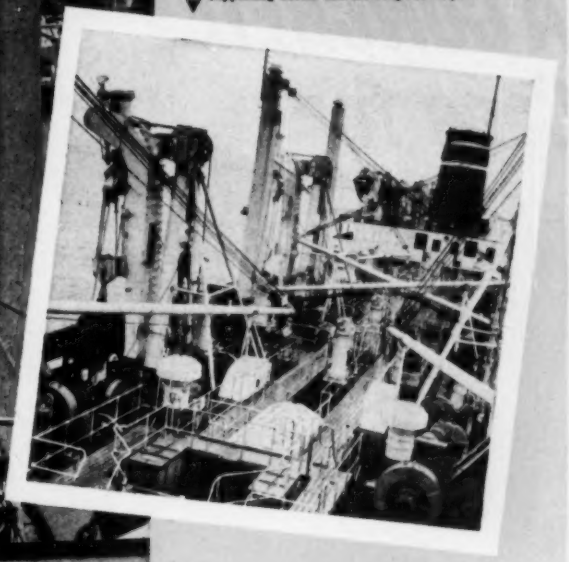
Judge it by the jobs it handles



LOWERING THE GIANT "SUCKERS." A tough job where Tiger Brand Rope shows its strength and endurance. This rope is in and out of the water constantly and must withstand corrosion, abrasion, vibration and fatigue.

TIGER BRAND WIRE ROPE DOES THE HEAVY WORK. Everywhere you look on shipboard you see Tiger Brand Rope for hoisting cargo, lowering life boats, supporting booms and mooring the ship.



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No matter what application you have for wire rope, the Tiger Brand Specialist can help you select the kind that fits the job. Proper application and care will enable you to get the most service at the lowest cost. Call on the Tiger Brand Specialist for a wire rope check-up. There's no obligation

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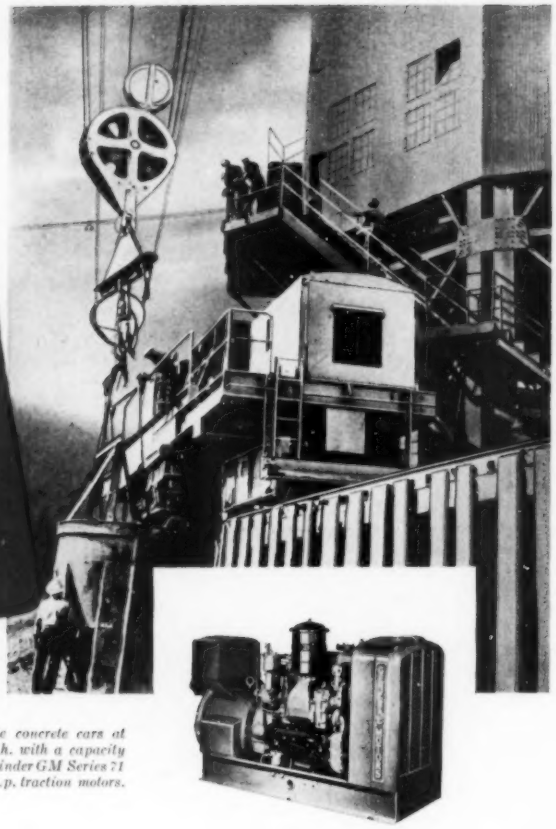

Built by Washington Iron Works, Seattle, the concrete cars at Hungry Horse Dam have a top speed of 5 m.p.h. with a capacity pay load of 32 tons. Each is equipped with a 4-cylinder GM Series 71 Diesel generator set furnishing power to two 20-h.p. traction motors.

THREE specially built Diesel-electric concrete cars, used by the General-Shea-Morrison group at Hungry Horse Dam, are a vital link in the carefully planned facilities with which the contractor expects to place a million cubic yards of concrete this year.

Carrying two 8-yard side dump hoppers, the cars move concrete from the mixing plant to points directly under cableways where they discharge into buckets. This eliminates time lost moving buckets on and off cars—saves travelling time of the 500-ton cableway tail towers—increases cableway capacity by at least 25%.

It's a job that calls for smooth coordination. There can be no failure or falter. Shutdowns would be costly. So General Motors Diesel generator sets were a natural choice to power these cars.

Because they are 2-cycle, with power at every downstroke, GM Series 71 engines are compact, smoother in operation and quicker starting. They are designed for easier servicing; have no high pressure fuel lines and offer maximum interchangeability of parts.

Add to these advantages their higher power-per-pound, their economy and rugged durability, and you'll see why contractors everywhere are turning to GM Diesels. Get the full story from your local equipment dealer or write direct to us.

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GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

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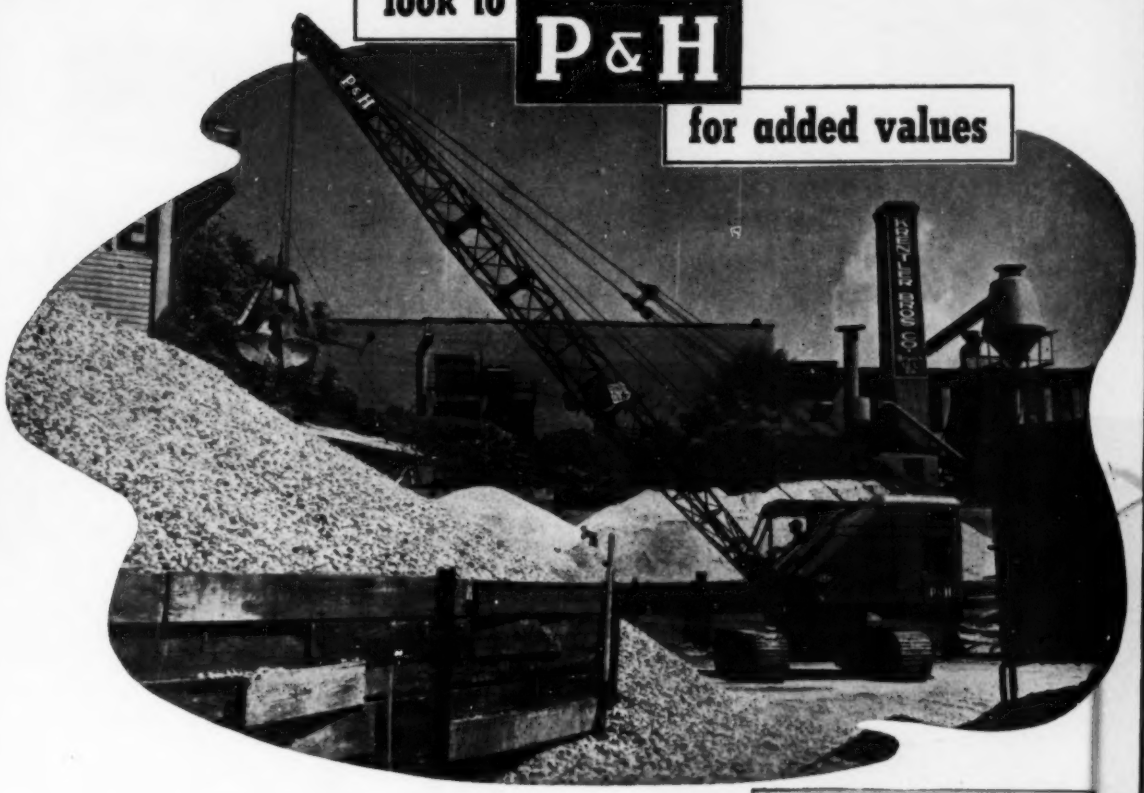

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EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS and ELECTRODES • CRAWLER and TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

THE JOBS IT CAN DO WOULD FILL A BOOK

ALLIS-CHALMERS HD-5

...The Most Versatile Tractor Ever Built

Engineered Completely New from the Ground Up with Big Tractor Design, Balance and Stamina

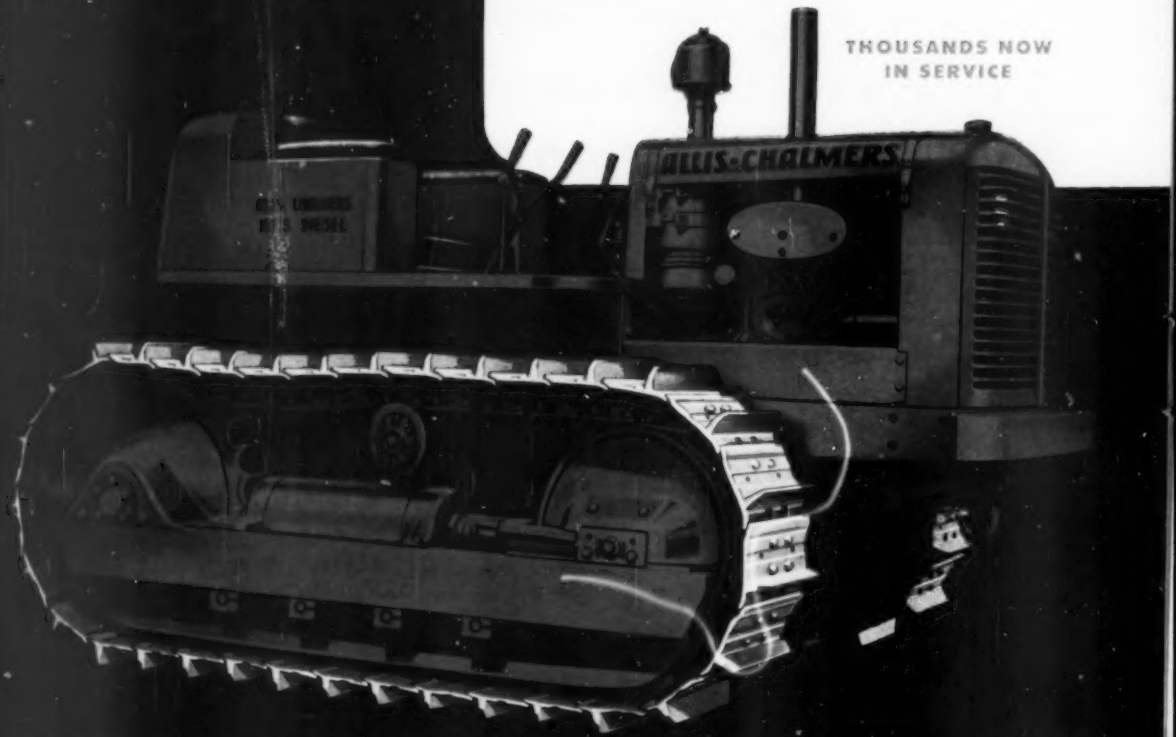
Weight:
10,500 lbs. — 44" tread
11,250 lbs. — 60" tread

Speeds:
5 forward, to 5.47 m.p.h.
1 reverse, to 1.99 m.p.h.

Horsepower:
40.26 drawbar

Engine:
General Motors 2-Cycle Diesel

THOUSANDS NOW IN SERVICE



NOT TIED DOWN TO SPECIALIZED DUTY — YET GIVES SPECIAL PERFORMANCE ON EVERY JOB

Hydraulic Bulldozers and Gradebuilders (track or engine-mounted models).
Root Ripper (interchangeable with bulldozer or gradebuilder moldboards).
Hydraulic "V" Snowplows with Wings.

Hydraulic Bulldozers and Dozecasters.
2-Wheel Hydraulic Scrapers. Hydraulic system optional. Scraper can be hooked in with bulldozer or Tracto-Shovel hydraulic system.

...with Its Wide Range of FULLY MATCHED Allied Equipment

Each Allied manufacturer, firmly established and skilled in his own field, worked in complete cooperation with Allis-Chalmers in the development of this auxiliary equipment.

Yes, the HD-5 with any Allied unit is a fully matched power package . . . matched for greater output at lower cost.

Straight and Angle Blade Hydradozers.
Land-clearing Blades: alone or in combination with dirt-moving blades.
Logging Canopies.
Winches for construction, logging, oil fields, other operations.
Log Carts.
Tractor Cranes.

TRACTO-SHOVEL . . . with interchangeable attachments for handling a wide variety of jobs—dirt, material and rock-handling buckets, bucket teeth, bulldozer and angledozer blades, lift fork, crane hook, trench hoe, V-type snowplow, drag bucket, tine fork and rock fork.

SKID-LOADER . . . with interchangeable racks for transporting, loading and unloading pulpwood, logs, stumps, lumber, ties, slabs and edgings, slash, mine props and other wood.

"SEEING IS BELIEVING"...ASK YOUR ALLIS-CHALMERS DEALER FOR A DEMONSTRATION

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

For Greater Production...
For Easier Operation...
For Simplified Servicing

OVER 60% OF ALL EUCLIDS SOLD ARE REPEAT ORDERS . . .

PROOF of CUSTOMER SATISFACTION . . . . . PROFITABLE PERFORMANCE !

Leading contractors and industrial users buy "Eucs" because they are designed and built throughout for heavy off-the-highway hauling. And because Euclids are job proved for high production at the lowest cost per ton or yard moved, owners add to their fleets as more equipment is needed.

Nine out of every 11 Euclids built are still in use today. Their ability to stay on the job year after year under a wide range of operating conditions means more yards moved at greater profit.

Euclid owners also know they can depend on prompt, efficient service from Euclid's world-wide distributor organization.

Write for information on the complete line of Euclid equipment or see your Euclid Distributor today.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS

Trucks get there *FASTER* at Lower Cost with... EATON 2-Speed Truck AXLES

By combining pulling power and speed, Eaton 2-Speed Axles add to truck utility and permit faster trips, more pay-load miles—on the highway or off. Eaton Axles reduce stress and wear on engines and all power transmitting units. This means longer life and minimum maintenance cost...and Eaton's planetary design adds thousands of miles to *axle* life. Gear tooth loads are better distributed; gear speeds are slow; stress and wear are held to a minimum. Eaton Axles are available for most trucks of 1½ tons and larger. Ask your truck dealer for a road demonstration.

Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

EATON **PRODUCTS:** SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

Split Half a Second into Sixteen Parts . . . *and you get a sensational improvement in blasting methods!*

Here's a picture that shows WHY the ROCKMASTER Blasting System pays off! Notice the rock in motion. And yet the explosive gases are held within the burden. No spectacular "spouts" of gas going to waste. Result: Greater explosives efficiency, better fragmentation, less vibration, greater safety.

In a ROCKMASTER blast, holes are electrically fired at controlled split-second intervals. The timing is in each electric blasting cap. The ROCKMASTER "16" series offers you a choice of sixteen millisecond delay detonators, all starting together, all firing at timed intervals in a little over half a second!

For rock, coal, ore—on the surface or underground

Your job may call for two, three or all sixteen ROCKMASTER detonators. We help you select them to fit your job. Drill pattern and explosives are based on what you want to accomplish. Many times, this means important savings in drilling and dynamite.

Write for your copy of the booklet on the ROCKMASTER "16" Blasting System. It includes diagrams for loading in quarrying, stripping, mining, construction.

Less Bark *More Bite*

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

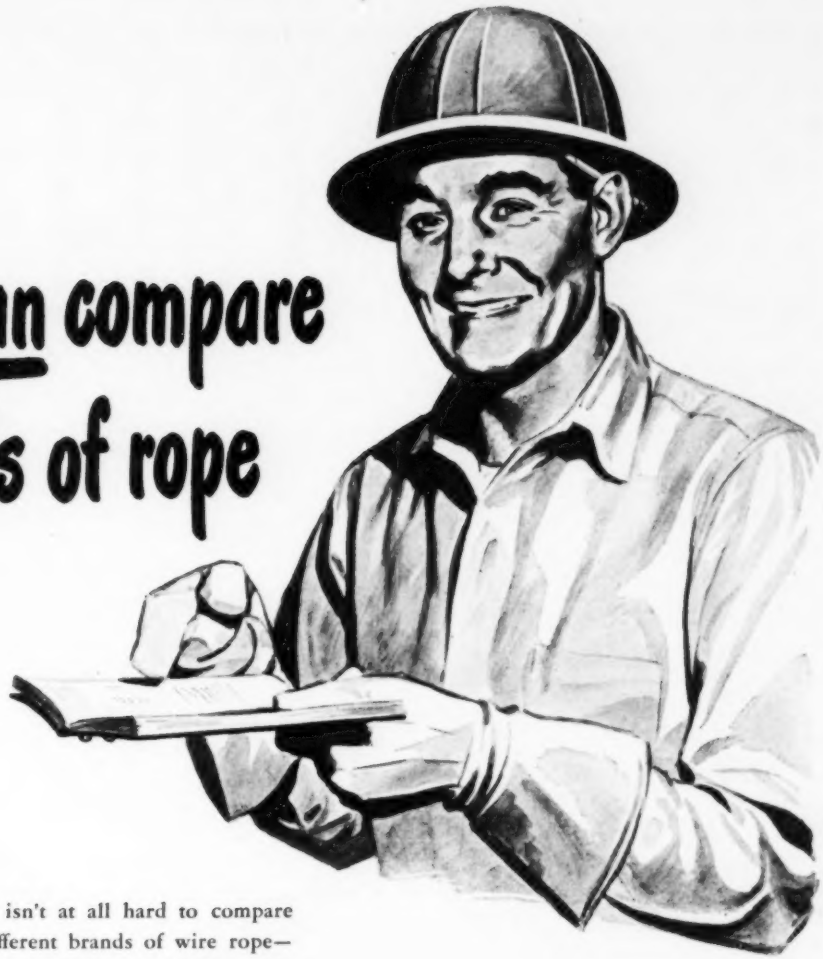
ROCKMASTER Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

You can compare brands of rope



It isn't at all hard to compare different brands of wire rope—not if you keep a simple system of records.

These records should, of course, show the work totals done by your wire ropes during their lifetime. Pick as a basis the unit of work most applicable to your line of business—a ton-mile, for instance, in oil-country drilling; a cubic yard of rock moved; a car of coal hauled up a slope, etc. When the ropes have finally been retired from service, see how much—or how little—their cost has been per unit of work.

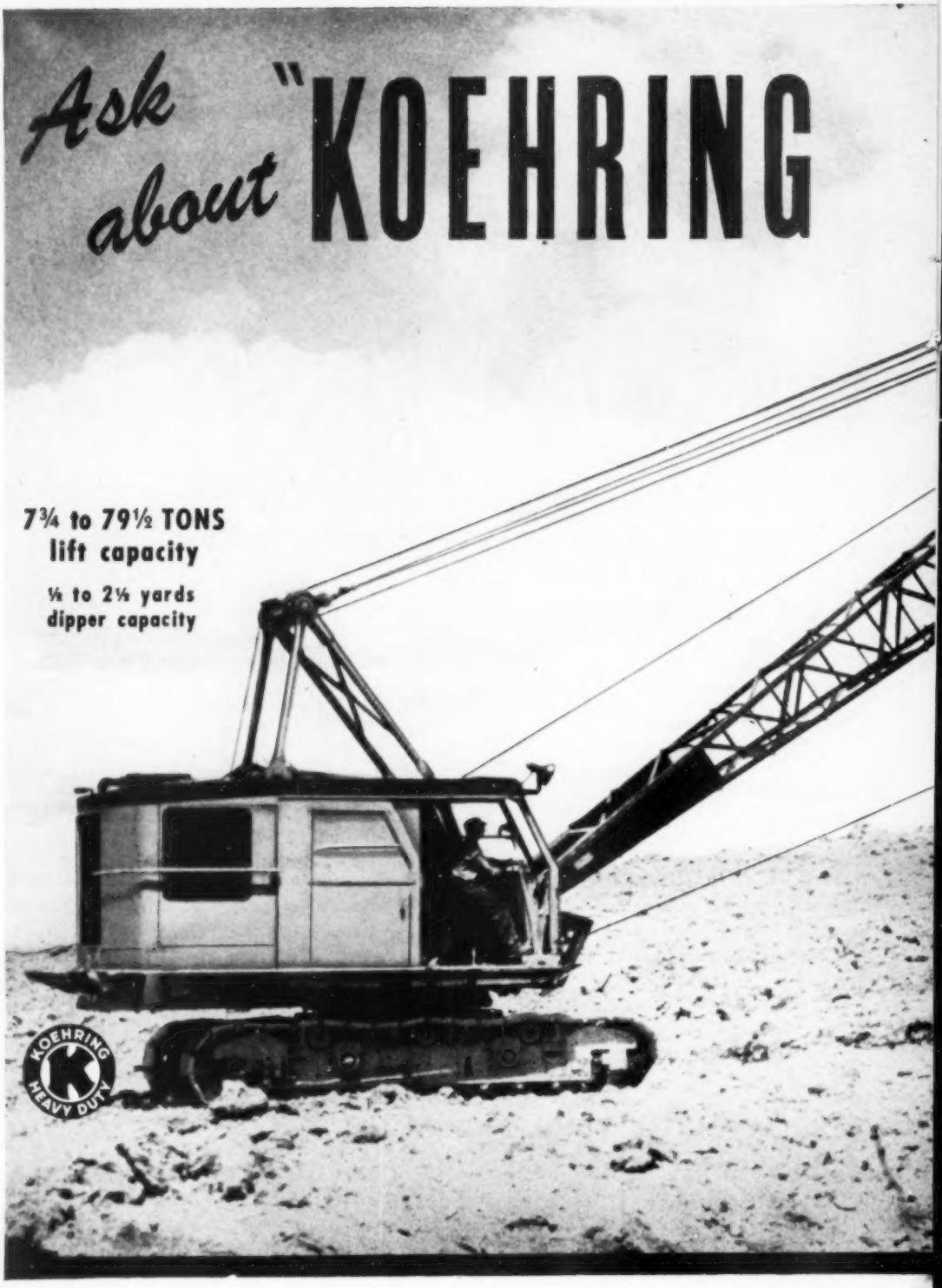
Bethlehem has always advocated the keeping of such records. One reason (we admit it freely) is that Bethlehem wire rope is an *economical* rope, and your records will prove it. We welcome comparisons with anybody's product.

LET YOUR RECORDS TELL YOU!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation


Ask about "KOEHRING
7¾ to 79½ TONS
lift capacity
½ to 2½ yards
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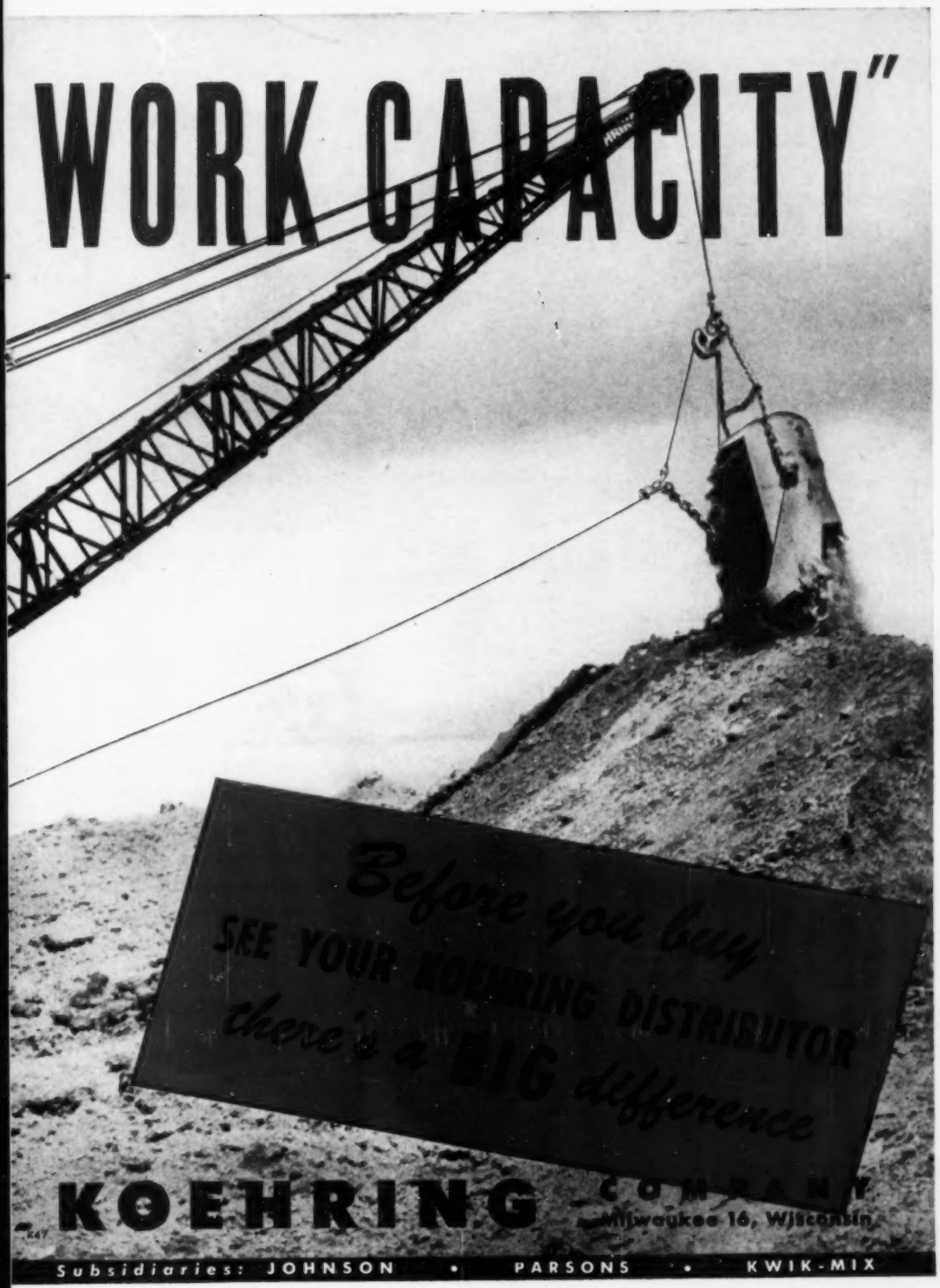
KOEHRING
HEAVY DUTY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Before you buy
SEE YOUR KOEHRING DISTRIBUTOR
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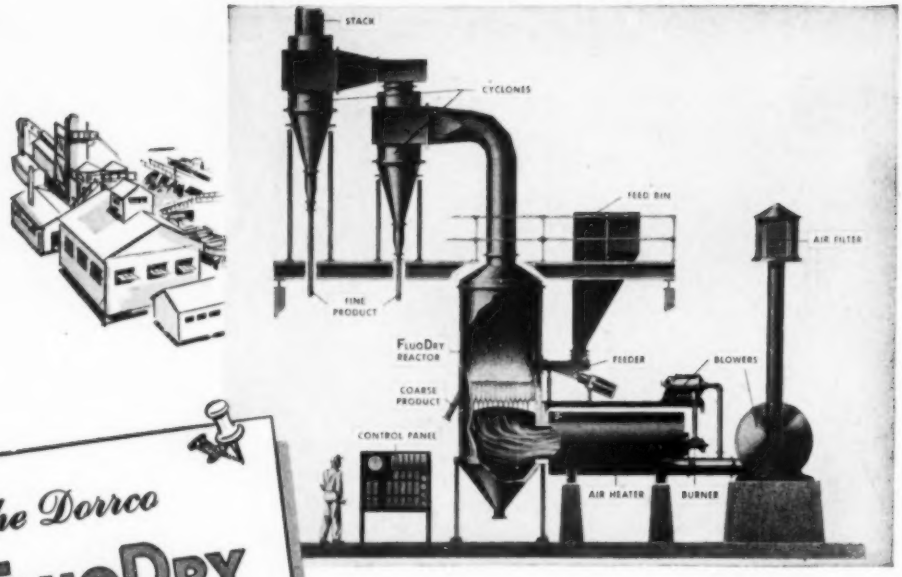

the Dorrco

FLUODRY

system

A new method of drying surface moisture and of accurately dry-sizing in the 28 to 100 mesh range through the use of fluidization.

Limestone and Dolomite Fines

FluoDry can dry limestone or dolomite fines as produced, or as reclaimed from stockpile, and recover them as such salable products as limestone sands, agstone or higher-priced fillers.

Sand Products

FluoDry can dry, or selectively size, sand products in those ranges where the material is too fine to screen and too coarse for air separation.

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FluoDry can dry industrial minerals such as phosphate rock, potash and ilmenite sands with greater efficiency and economy than conventional methods.

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If these facts sound interesting and you have an active problem of drying or sizing, we will be glad to discuss it in detail.

WHAT ARE THE ADVANTAGES OF FLUODRY AS COMPARED WITH CONVENTIONAL DRYING AND SIZING METHODS?

1. More accurate temperature control
2. Lower fuel requirements
3. Lower maintenance costs
4. Lower investment cost
5. Lower operating cost
6. No moving parts

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BARRY PLACE, STAMFORD, CONN.

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PETREE & DORR DIVISION, STAMFORD, CONN.

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RESEARCH — ENGINEERING — EQUIPMENT

Gates

REG. U. S. PAT. OFF.

Achieves the long-sought V-BELT DRIVE for LOOMS

For Cotton Mills and Rayon Mills

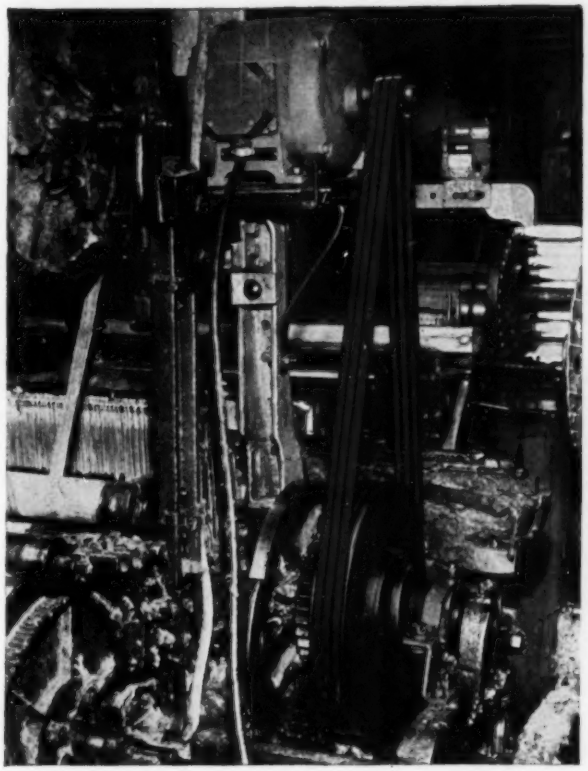
Loom operators had long *wanted* a V-Belt Drive for their looms. *But*—

Stubborn Difficulties

—stood in the way. Gates over-came these difficulties through *SPECIALIZED* research in the world's largest V-Belt testing laboratories, thus providing—

Another Accomplishment For Industry

by Gates *SPECIALIZED* Research



THE extremely small diameter of pulleys over which loom drive V-Belts must flex under severe shock-loads posed a problem in V-Belt construction that seemed *insurmountable.*

But, with war-born synthetic fibers of unusual strength; and with man-made rubbers possessing engineering properties never available before—and with the great research and testing facilities available at Gates—a V-Belt was achieved that met the rigorous conditions of loom drive operation.

Then, a clutch of very advanced design was wanted—a clutch that would do *more*, with *less* maintenance, and *fewer* troublesome adjustments than the clutches commonly used with gear and pinion drives on looms.

Gates therefore engineered a clutch that is a marked improvement over the clutches previously available for looms.

Finally—and this was most important, too—the entire drive assembly had to be so designed that it would go on the loom without any costly re-arrangement of existing mill equipment. This rather demanding job of design was also accomplished.

Today, the Gates V-Belt Drive for looms is cutting operating costs—and giving bigger loom output with better quality of cloth—in Cotton Mills and Rayon Mills the country over—another accomplishment of Gates *SPECIALIZED* Research!

ENG-505

THE GATES RUBBER COMPANY
The World's Largest Makers of V-Belts
DENVER, U.S.A.

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

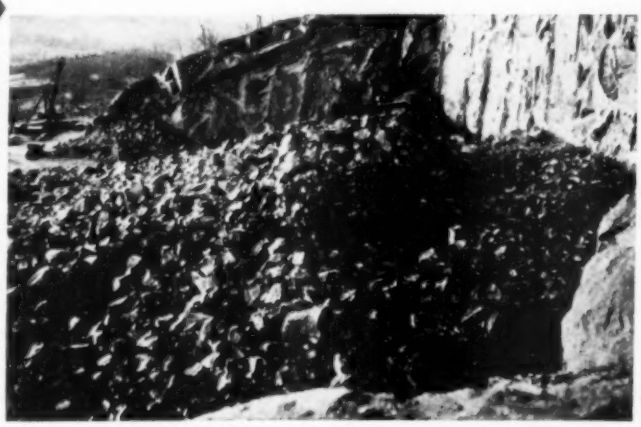
FRAGMENTATION..EXCELLENT!

Safe, easy-to-follow Du Pont Quarry Blasting Plan cuts production costs for Virginia quarry

THE DU PONT QUARRY BLASTING PLAN was employed at the Superior Stone Company's Red Hill granite quarry with outstanding results. Since the rock was exceptionally hard, Du Pont "Nitramex"* was used exclusively. "Nitramon" Primer, Primacord and electric blasting caps detonated the charge.

LOADING PROGRESSED SMOOTHLY. A total of 71,481 pounds of "Nitramex" was loaded into 16 well drill holes, ranging from 170 to 200 feet in depth with an average burden of 30 feet. Circuit wires were attached to a Du Pont Blasting Timer set for intervals of .015 second between holes. The shot was fired by remote switch.

EXCELLENT FRAGMENTATION with little back break characterized the blast which brought down a volume of 82,800 cubic yards of rock. Results of this calibre have proved the Du Pont Quarry Blasting Plan most economical in many types of quarries, including shale, limestone, cement and trap rock. Ask your Du Pont Explosives representative for complete information about this better, safer blasting plan today. E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.



"Nitramex" is well known for its safety, ease of handling and non-headache-producing qualities.

"Nitramex" is a registered trade-mark for Du Pont ammonium nitrate blasting agent.

DU PONT

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

NOW 8 BASIC CHRYSLER ENGINES

FROM WHICH TO CHOOSE

In scores of industrial applications, Chrysler Industrial Engines are out-performing all other similarly rated engines. With less down time! With lower lifetime cost per hour. That comes from famed Chrysler engineering and high precision manufacturing. Yet thanks to Chrysler mass production economies, you can buy Chrysler power for *less money!*

If you use internal combustion power requiring 200 to 400 cubic inches piston displacement, get *more for less!* Phone your Chrysler Industrial Engine dealer or write us. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

CHRYSLER

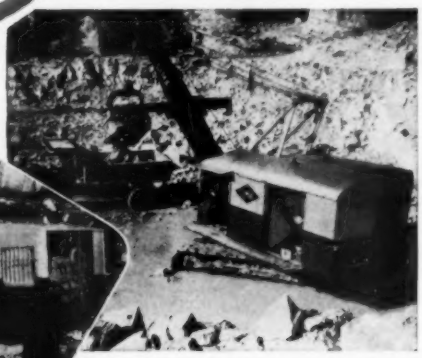
Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE

LIMA

SHOVELS, CRANES AND DRAGLINES...

Strip more *Dig more* *Load more*



(Above) LIMA Type 802 Air Control Shovel with 24½ foot boom, 18 foot dipper handle and 2 yard dipper loading limestone.

(Left) LIMA Type 1201 Dragline, with 60 foot boom and 4½ yard bucket in operation near Dayton, Ohio.

(Center) LIMA PAYMASTER Shovel, with 18 foot boom, 15 foot dipper handle and ¾ yard bucket in a quarry near Hillsgrove, R. I.

because of CONTINUOUS OPERATION

Breakdowns in mining operations are costly—not only because of difficult on-the-job maintenance, but also because of down time of expensive equipment and labor. That's why LIMA shovels, cranes and draglines, with extra "built-in" stamina for the rugged job of coal stripping and open cut mining, pay big dividends by assuring continuous operation with maximum output at lowest cost.

Sturdy unit-type construction, simple, rugged design, low center of gravity, long wide crawlers, permanent shaft alignment, smooth running anti-friction bearings, ample power for big output, big cable drums, air-operated clutches, large braking areas, and maximum use of properly selected heat-treated alloy steels—these are only a few features which help you *strip more, dig more* and *load more* with a LIMA.

The LIMA line includes Shovels ¾ to 6 yards, Cranes to 110 tons and Draglines variable. Rubber-Mounted units are available for ¾ and 1 yard Shovels, and Cranes to 35 tons. Lima Sales and Service offices in principal cities of the world.

Lima Shovel and Crane Division

LIMA, OHIO

LIMA HAMILTON CORPORATION

OTHER DIVISIONS: Lima Locomotive Works Division, Atlas Steel Works, Gar Wood, Owens, Beaudette Co.

Model HM
4-WHEEL DRIVE
PAYLOADER
SPEED –
POWER –
TRACTION –
Versatility

The Model HM Payloader is a complete Hough-built unit . . . a powerful 1½ cu. yd. tractor shovel with large pneumatic tires, 4-wheel drive and four speeds in each direction. It has the power, traction and flotation to work on all kinds of ground . . . to dig, load, carry, grade, level and spread . . . converts in a few minutes to a bulldozer, a crane, or a "V" snowplow. Not a fair weather worker, but a year 'round tool.

HM versatility is backed by many other outstanding Payloader advantages . . . power-booster steering, 76 h.p. gasoline or diesel engine, double-acting hydraulic boom and bucket control, unequalled operator comfort and visibility. The complete HM Payloader story is yours for the asking. See your Hough Distributor, or write The Frank G. Hough Co., 750 Sunnyside Avenue, Libertyville, Illinois.

SEND for HM catalog, or literature on other Payloaders — the 1¼ yd. Model HL, the ¾ yd. HF, the ½ yd. HE, the 12 cu. ft. HA.

SAY HUFF

HOUGH
PAYLOADER
Manufactured by THE FRANK G. HOUGH CO.

Only KUE-KEN* GYRACONES Crush Without Rubbing

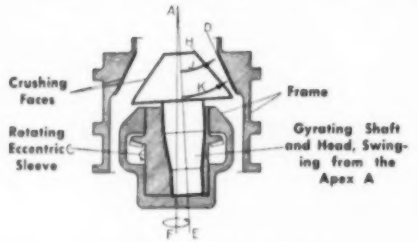


Fig. 1 — Kue-Ken Crushing Principle

Figure 1 shows that the correct crushing motion of the Kue-Ken Gyracone is due to the proper location of the apex of gyration with relation to the crushing faces. The line AF is the center line of the frame, with the stationary crushing face D and the sleeve bearing C truly concentric with it. The line AE is the center line of the shaft and crushing head, and is off center or "eccentric" to the frame. Where these two lines meet above the crusher at A becomes the all important "apex of gyration." It is important because all parts of the crushing head must swing or gyrate from this point. Therefore, when swinging, all parts of the crushing faces must follow the path of an arc struck from the apex point A. Such arcs are shown at J and K. Check them with a pencil compass. Note how squarely these arcs pass through the crushing zone. Rock is instantly gripped and crushed between the crushing faces — **without slipping and rubbing.** Wear and power is reduced to the minimum — capacity is maximum.

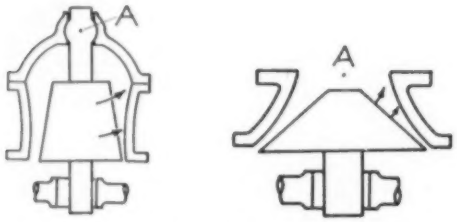
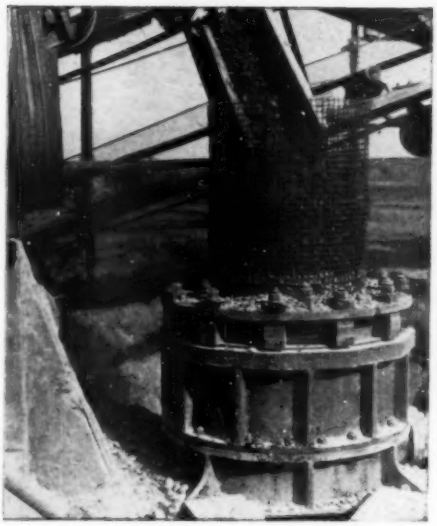


Fig. 2 — Crushing Machines With Rubbing Motion

Figure 2 shows two commonly accepted types. Note that the location of the apex of gyration in relation to the crushing faces has apparently received no consideration. Other designs, with a curved crushing zone, must necessarily disregard the location of the apex, and are therefore included in this comparison. Consequently the arcs, also struck from apex points A and indicating the path of the crushing head, pass through the crushing zone at an acute angle, thus crushing with a glancing stroke, not squarely. This means that rock is forced upwards, slipping, rubbing and grinding away the costly crushing faces. Wear and power are excessive; and capacity is not what it should be.

*Pronounced Que-Ken. U. S. and Foreign Patents Pending.

COMPARE THESE CRUSHING PRINCIPLES WITH YOUR EQUIPMENT



3 FT. KUE-KEN Gyracone crushing hard river gravel with choke feed requires adjusting for wear 1/10th as often as well known gyratory previously used.

MODERN DESIGN

Note the extremely low headroom . . . only 45" high from foundation to receiving hopper. Takes choke feed. No restricting spiders to reduce flow. No feeder needed. Usually requires shorter elevators.

THE KUE-KEN GYRACONE is the only gyratory that operates on the long-improved principle of "crushing without rubbing." This means more capacity with less power, less wear and lower upkeep.

Get complete facts. Write today for Bulletin 604.

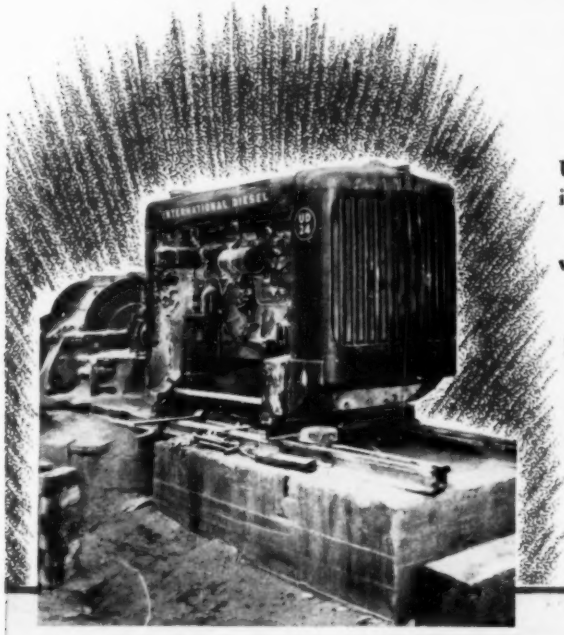
Exclusive manufacturer for Eastern U. S., Canada and Puerto Rico: Pennsylvania Crusher Co., Broad and Arch Street, Philadelphia, Pa.

543 CHESTNUT STREET • OAKLAND 20, CALIFORNIA

STRAUB MFG. CO.

Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyratory Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

An INTERNATIONAL UD-24 Crushes Stone—and Costs



If "crushing" power costs are crushing your profits, it's time to turn to International Power.

The Crystal Lake Crushed Stone Co. of Sheboygan, Wis., uses an International UD-24 Diesel for power. The cost per yard is only 3-1/5 cents for fuel and lubricating oil.

"This unit is doing a good job for us and we are well satisfied with its performance," says pit superintendent William Fricke. Like pit and quarry men everywhere, Mr. Fricke has discovered that power costs drop and production rises when the power is International.

A visit to your International Power or Power Unit Dealer will give you the facts about International Power—the power that pays. Make that visit soon.

INTERNATIONAL HARVESTER COMPANY • Chicago

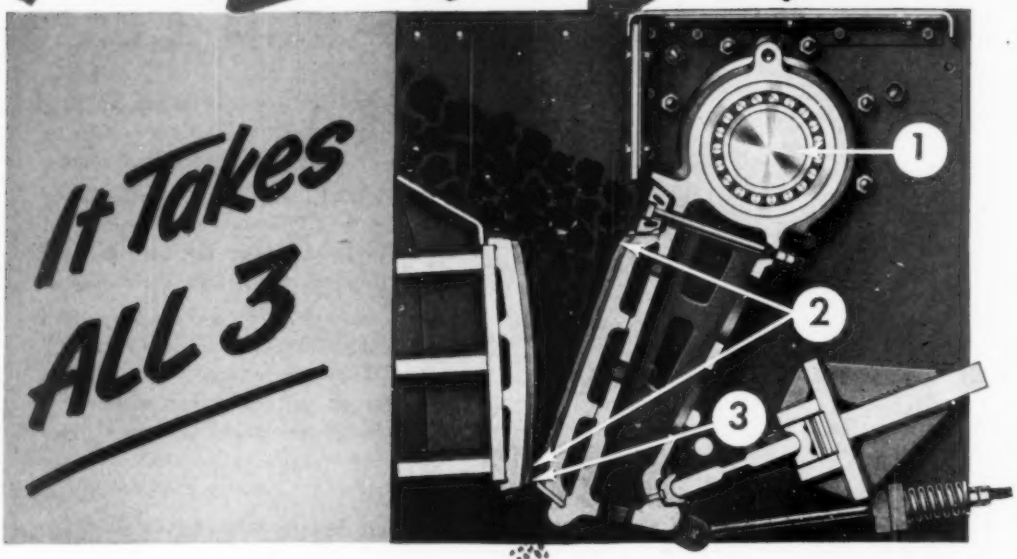
Standardize on Power that Pays

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS

1 speed 2 long jaws 3 long stroke

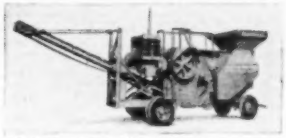


to put the maximum amount of rock through a jaw crusher

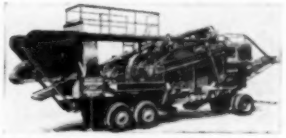
A-W design takes full advantage of these basic requirements. That's why these heavy-duty crushers turn out so much rock.

. . . and that's one big reason for the uninterrupted flow of material through the crushers and over the screens and conveyors of Austin-Western portable plants. No bottlenecks . . . no delays . . . just constant, high speed production.

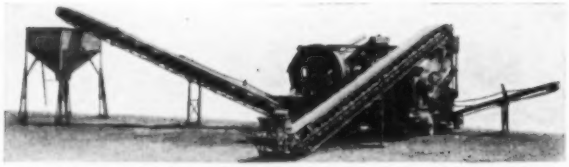
AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.



"61"—For the smaller jobs where accurate grading of finished product is not required. Simple . . . economical . . . easily moved.



"201"—High output, portable gravel plant capable of producing especially large amounts of ¾" and smaller product.



2-UNIT AND 3-UNIT PLANTS—Higher production than that of a single unit plant, thanks to larger crushers and multiple screens. Deliver several sizes of finished product.

"101"—For contractors or counties needing extra large amounts of material. Equally useful in gravel and quarry service.

BUILDERS OF ROAD MACHINERY SINCE 1859

Austin Western

Wisconsin Ruby Red Granite memorials are quarried and processed by Anderson Bros. & Johnson Company. Quarry and finishing plant are at Granite Heights and Wausau, Wisconsin.

Ruby Red Granite

Safe all the way by AMERICAN DERRICK

Riding out of a deep quarry near Wausau comes a block of famous Wisconsin Ruby Red Granite, known for its deep red color and mirror finish after processing. An AMERICAN Derrick brings the giant granite blocks up out of the hole . . . lifts them surely and safely. The operation is precise, economical and completely safe.

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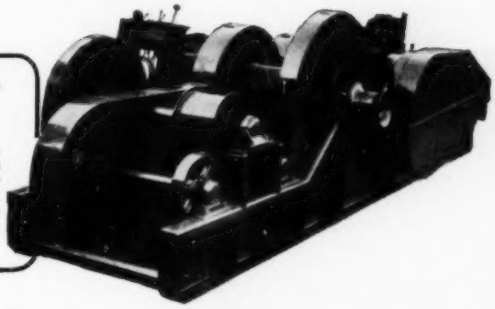

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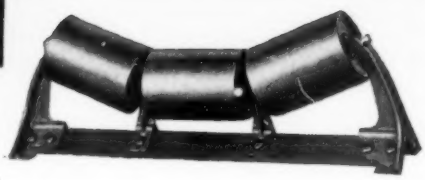

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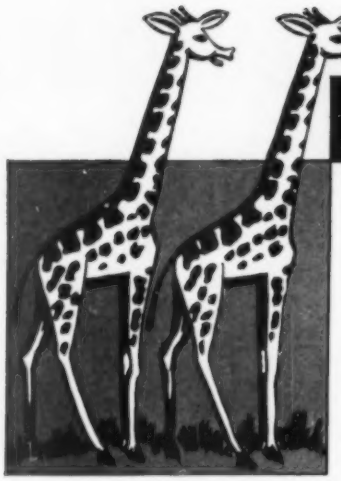

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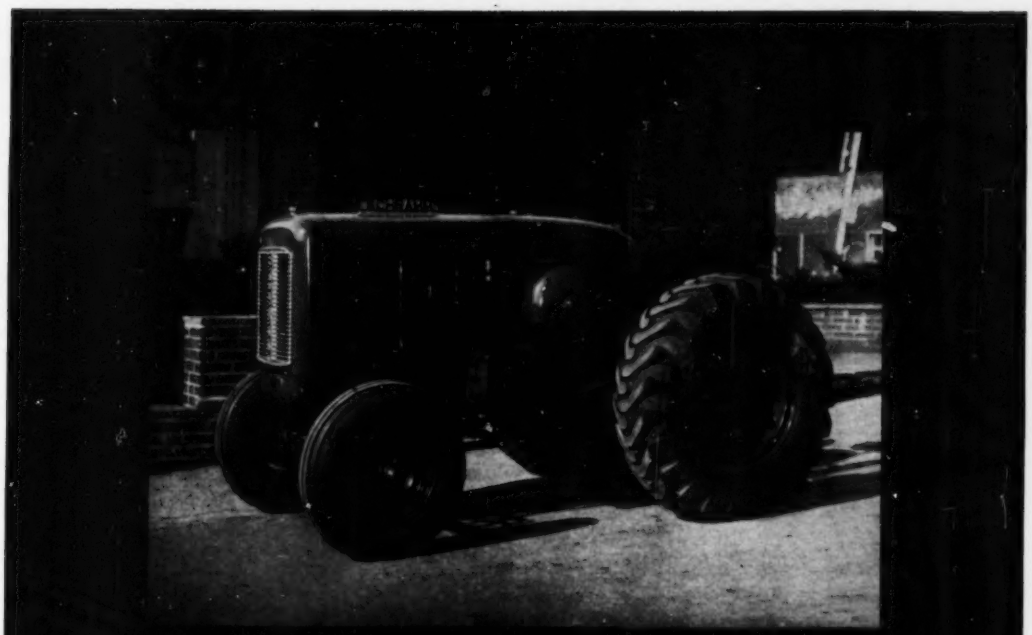

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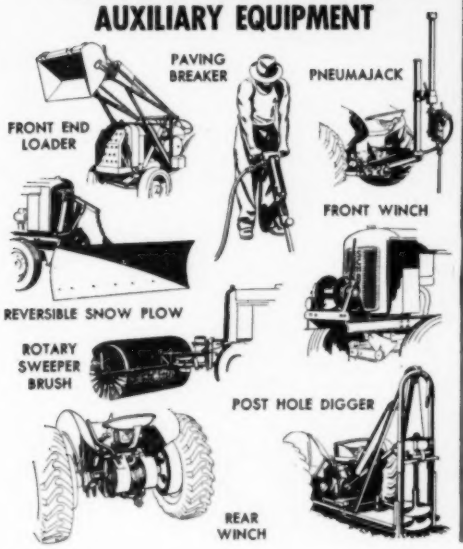

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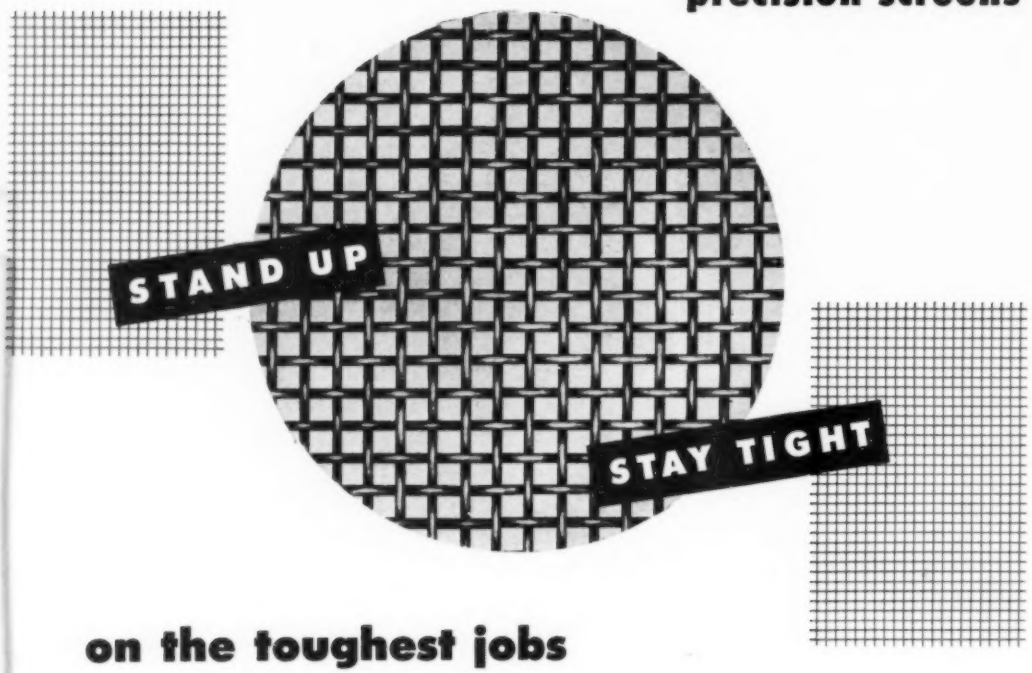

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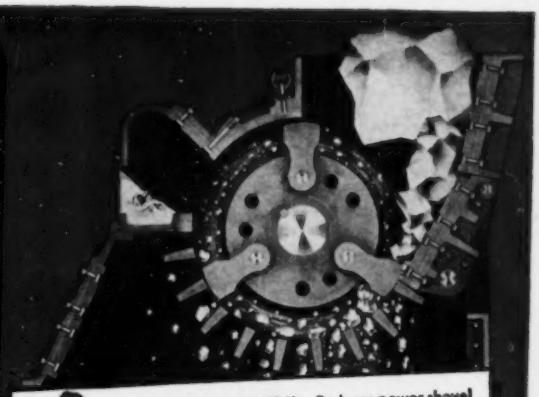

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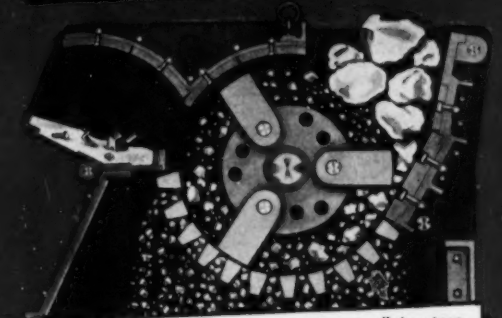

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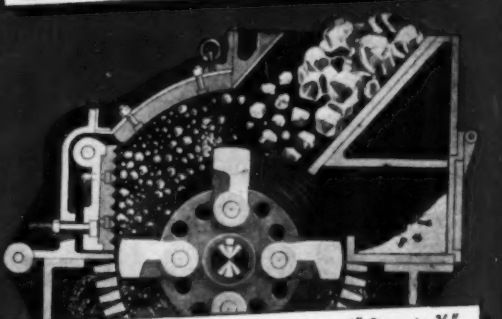

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National Lead Company have built a fleet of 4 Lorains to meet a wide variety of work on their wide-spread operations. They chose Lorains because Lorains are available in a full range of sizes — big or small — as shovels, draglines, clams, or hoes — with crawler or rubber-tire mountings — to meet every stripping, mining and pit or quarry need. You can cut your production costs, too, with the right Lorain on your job . . . and your Thew-Lorain Distributor can show you how Lorains can fill the bill.

At their Marley, Texas property, *National Lead Company mine soft, porous Bentonite with a new Lorain TL-25 dragline. This is one of 4 Lorains owned by this well-known producer.*

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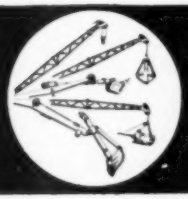

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Style S—Standard
Style FC—Fine Crushing

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7. Available with either coarse or medium bowl.

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Y-4

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THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank.

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FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities; materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

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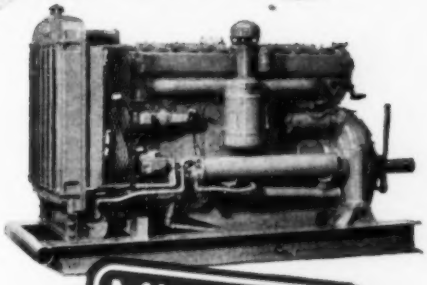

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Greater Economy — Longer Life

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for all services

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Vol. 43 JULY 1950 No. 1

PIT AND QUARRY

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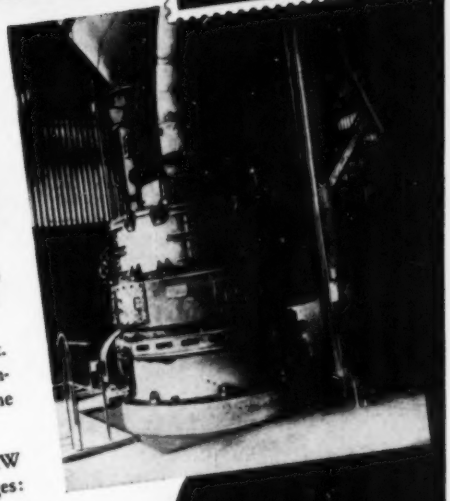

For the direct-firing of its new 10-ft. by 380-ft. kiln at St. Louis, Alpha Portland Cement Company has selected a B&W Type E Pulverizer. The new kiln is designed for the wet process.

In both wet process and dry process installations, B&W Pulverizers bring the following advantages: ability to dry and grind coals of high-moisture content to consistently uniform fineness, regardless of wear of the grinding elements; high availabilty, low maintenance; close, one-point control of coal-air ratio and volume.

You can look with confidence to B&W for service-proved economy and efficiency in coal pulverizing equipment, for direct-firing of any type or size of kiln. The Babcock & Wilcox Company, 85 Liberty Street, New York 6, N. Y.

BABCOCK & WILCOX

C-191

editorial

Prospects Good for Percentage Depletion

THE House Ways and Means Committee on June 23, 1950, reported out the tax revision bill (H.R.8920) which provides for percentage depletion for a number of nonmetallic minerals not already receiving it. The bill was then scheduled for debate before the House and, if approved, as it seems certain it will be, was then to go, for hearings and study, to the Senate Finance Committee, which announced that it would start hearings on Monday, July 3. The bill would then go to the Senate floor and then, if again approved, to a conference committee which would compromise any differences between the House and Senate bills. The resulting bill would then go to the President for his signature.

Only a few weeks ago the general opinion was that if a percentage depletion (tax revision) bill did get that far, the President would certainly veto it and that there was no possibility of its being passed over his veto at this session of Congress. Prospects now are much more favorable, and it seems almost certain that the bill will become law. Congress is reported to be determined to pass a tax revision bill before adjournment and, it is rumored, may stay in session through August or even later in order to see this and other matters through. President Truman is now reported willing to sign this bill provided that there is no loss in revenue to the government. Measures are being taken to insure against such loss. Apparently only war can prevent its passage.

ON JUNE 7 the Ways and Means Committee had eliminated a discrimination against crushed stone by voting to extend a 5 percent depletion allowance to stone. Previously on May 18 and 19 it had extended a 5 percent allowance to sand, gravel, granite, and marble, and 15 percent to fuller's earth, refractory clay, quartzite, perlite, diatomaceous earth, and limestone when calcined or when used by metallurgical or chemical industries.

After its failure the previous year the matter of percentage depletion came up with dramatic suddenness when, on only three days' notice, the House Ways and Means Committee on February 9 opened its hearings on the bill. Fortunately most of the interested industries were ready and submitted their evidence. The action on May 18 and 19 after several months of uncertainty was just as much of a surprise, and subsequent actions indicate an accelerated tempo which might bring the bill to final passage earlier than one might expect.

GOING further back into history, percentage depletion began in 1926, when a depletion rate of 27½ percent of gross income was established for oil and gas. In 1932 similar provisions were made allowing 5 percent for coal, 15 percent for metal mines and 23 percent for sulphur. In 1942 percentage depletion of 15 percent was allowed for fluorspar, ball and sagger clay, and rock asphalt. Later the same rate was applied to flake graphite, vermiculite, beryl, feldspar, mica, talc, lepidolite, spodumene, barite, thenardite, potash, bauxite, phosphate rock, bentonite, and gilsonite.

Members of these industries and the trade associations representing them have done an excellent job of bringing before congressmen and, in particular, the members of the Congressional committees, the importance of percentage depletion to the future of these important basic industries and the injustice of the present law which accords percentage depletion to certain nonmetallic minerals industries while denying it to others. The path this bill must follow is still a hazardous one, however, and a continuation of these efforts is necessary in order to insure the passing of the bill at this session of Congress.

World Cement Conditions

A FEATURE of this 22nd Annual Cement Mills Edition of PIT AND QUARRY is the first of a series of articles on conditions in the cement industry throughout the world. In it we are attempting to give at least a general picture of the conditions in each cement-producing country, as well as brief descriptions of some of the more important plants, particularly those built or extensively improved since the war. As is always the case with such an ambitious project when conducted largely by mail, the results obtained are incomplete in some respects. A vast amount of information has been received, however, which, together with that from other sources, makes it possible to present local and world conditions with a fair degree of accuracy and completeness.

When we last attempted this task nearly four years ago, conditions in many war-torn countries were still confused and unsettled and there had been little expansion and few improvements in the cement industry since before the war. In countries not directly affected by the war, plants had become obsolete and worn out because no repair or replacement parts or equipment were available, all the major cement mill machinery companies being located in countries actively involved in the war. We predicted then that, as a result of this backlog of need, and because of the vast amount of reconstruction which would be necessary, many existing plants would be modernized and enlarged and new plants would be built in all parts of the world.

WE WOULD like to do an even more thorough job of coverage than is being done in this series of articles but we doubt if much more complete information could have been obtained by personally visiting each country. From some cement companies we have received the fullest cooperation. Many others, however, do not give out information on their operations, either because of company policies or by governmental order. We, of course, received little information from any source about the countries behind the "Iron Curtain."

This first installment of our latest world-wide cement review covers a part of Europe. The rest of Europe will be covered in August and the other parts of the world in succeeding issues.

Walter E. Trautfer

It always pays to get the advice of the Roebling Field Man and Roebling Engineers about any problems connected with wire rope. Their recommendations are based on technical research, knowledge of the latest wire rope developments and thousands of service records.

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MORE THAN 350 MILLION POUNDS OF MARFAK HAVE BEEN SOLD!

TEXACO Lubricants and Fuels

news of the industry

PIT AND QUARRY

Building Research Congress Scheduled in London For September 11-20, 1951

A preliminary announcement of a comprehensive congress on building research, to be held in London, England in September, 1951, has been relayed to us by the Portland Cement Association staff.

Sponsored by British professional institutions, societies, and government departments, the congress has as its central organization the Department of Scientific and Industrial Research. Its purpose will be to "review the progress made in research in relation to architecture, building, and the associated branches of civil engineering". Among the subjects to be considered and discussed will be the following:

The weathering and durability of building materials in temperate and extreme climates; lightweight concrete; quality control and accelerated curing of concrete; development in manufacture and the structural use of burned clay products; stone for housing; developments in quarry mechanization; gypsum products; lime; etc.

Dates of the meeting are September 11 to 20, 1951. Announcement of detailed arrangements will be made later; but those interested in the congress are requested to notify the organizing secretary at the following address: Building Research Station, Bucknalls, Lane, Garston, Watford, Herts., England.

National Gypsum Celebrates Silver Anniversary This Year

National Gypsum Company's silver anniversary celebration, held at Buffalo, N. Y., was opened at a luncheon attended by company executives and civic officials. Buffalo's Mayor Joseph Mruk, one of the principal speakers described National Gypsum as "the largest Buffalo-managed business" and characterized its growth typical of the vital industries that represent the city on the national scene.

Melvin H. Baker, president of the $60,000,000 corporation, outlined the firm's plans for the silver anniversary celebration. They included open house programs at the 23 plants scattered throughout the United States, climaxed by a giant "birthday party" at the Clarence Center plant in August.

Universal Atlas Cement Co. Occupies New Headquarters

In one of the largest office leasing transactions in New York City the Universal Atlas Cement Company, a subsidiary of the U. S. Steel Company, has taken two entire floors in the building at 100 Park Avenue for a long-term lease for its executive and general offices.

Total space to be occupied is approximately 50,000 sq. ft. in the 36-story newly-completed, fully air-conditioned building. Universal Atlas offices were for 20 years previously located in the Chrysler Building.

Arkansas Limestone Operates Batesville White Lime Plant

The Myersville operation of the Batesville White Lime Company, located at Croker, Ark., has been taken over and is being operated by the Arkansas Limestone Company.

Officers of the company include the following: L. R. Myers, president; C. W. Cobb, vice-president and general manager; Miss E. R. Wynne, secretary; and Mrs. Madeline Stokes, treasurer.

The board of directors is composed of Mr. Myers, Miss Wynne, and Mrs. Stokes.

Coming Events

July 19-20, 1950 — Cincinnati. Midsummer meeting, National Agricultural Limestone Association, Netherland Plaza Hotel.

August 2-3, 1950—Buffalo, N. Y. Midyear meeting of board of directors, National Slag Association, Hotel Statler.

October 16-20, 1950 — Chicago. 38th National Safety Congress and exposition, Stevens Hotel.

Idaho Portland Cement Co. Will Double Capacity In Big Expansion Plan

Expansion plans which will double the output of the Idaho Portland Cement Company's plant at Inkom, Ida., were announced recently by E. A. Dufford, vice-president and sales manager.

With the new production facilities expected to be in operation by next January, maximum daily production will be raised to 12,000 94-lb. sacks of cement per day. The expansion also will more closely assure year-around work for all employees of the plant, Mr. Dufford added. Employees now average about 60 men.

Largest item in the expansion will be a second kiln with a tube 120 ft. longer than the present 200-ft. kiln. Additional mills, a cooler, a coal mill and a wet-process basin will be among the new installations, together with expanded facilities for sack and bulk loading.

The Inkom plant, which is the only cement mill in southern Idaho, was erected in 1929. It adjoins a mountain which provides a virtually inexhaustible supply of high-grade lime, shale and silica.

When construction activity in southern Idaho began its upswing immediately after World War II, the company was confronted with a never-ending excess of demand over supply. Although improvements were made in 1948-49, Mr. Dufford said that demand continued to exceed supply, making the move to double capacity imperative.

"We anticipate this area will not be faced with any more shortage," he stated, "and we hope to have the new facilities in operation by January 1. Equipment has been purchased and construction will begin soon."

A folder entitled *National Lime Association Serving the Industry Since* 1902 recently issued by the association explains briefly all of the principal activities, functions, and purposes of the National Lime Association. It is intended that the folder will also interpret the N. L. A. to governmental agencies and educational and commercial institutions.

May Building Volume Down, But Five-Month Totals Top 1949 Jan.-May Figures

Construction contract awards in May declined, but only slightly, from the all-time record high in April, F. W. Dodge Corporation has reported.

May awards totaled $1,347,603,000, down less than 1 percent from the $1,350,496,000 of April, for the 37 states east of the Rockies. The May figure for 1950 was 53 percent ahead of May, 1949, and called for floor area of 125,586,000 sq. ft. of building space, or 72 percent more than for May, 1949.

Residential awards of $674,604,000 in May failed by only $232,000 to equal April's figure and were 95 percent ahead of May, 1949, carrying the five-month 1950 total of residential awards to a whopping 110 percent increase over the corresponding 1949 figure.

Within the residential classification, private residence awards of $653,271,000 in May were 1 percent ahead of April, and 116 percent over May, 1949, bringing the five-month 1950 total to 125 percent over the five-month 1949 figure.

Public works and utility contracts, says Dodge, strengthened May's performance by gaining 16 percent over April, to total $264,456,000, up 24 percent above the May, 1949, figure.

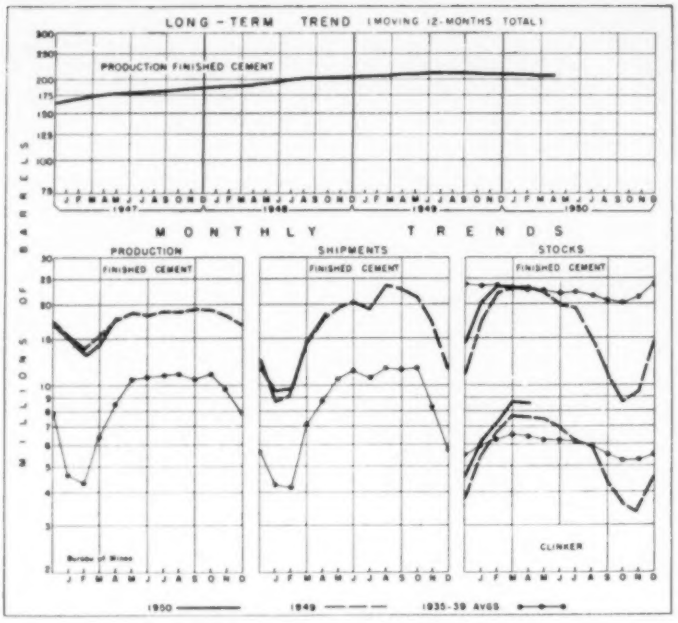
Dodge has reported contracts in the first five months of 1950 totaling $5,508,685,000, up 56 percent from 1949's five-month figure. The residential classification showed the greatest gains.

Hammermills, Inc., Acquired By Pettibone Mulliken Corp.

The Pettibone Mulliken Corporation of Chicago announces the acquisition of Hammermills, Inc., St. Louis, as a wholly owned subsidiary corporation. Hammermills, Inc., manufacture the complete line of "Bulldog" hammermills for mining iron ore, coal, copper, limestone, phosphate, gypsum, etc., and also used in cement and chemical plants, paper and pulp mills, power plants, packing houses, brick and tile plants. In addition Hammermills, Inc., manufactures a line of feed mills used in the feed industry and other industries having reduction problems.

C. M. Binder, president, and T. A. Oberhellmann, vice-president and chief engineer of Hammermills, Inc., will continue in the same capacity under P. M. Co. ownership. Mr. Binder has been associated in the hammermill manufacturing industry for over 32 years. He started Hammermills, Inc., in 1947, developing a complete new line of Bulldog hammermills of the moving breaker plate design. Many of these plants are now operating all over the world. T. A. Oberhellman has been associated in the same industry for over 25 years.

Headquarters for Hammermills, Inc., have been moved from St. Louis to the main office and factory of Pettibone Mulliken Corporation at 4700 West Division Street, Chicago, Ill.



SUMMARY—The production of 18,088,000 barrels of portland cement during April, 1950, as reported to the U. S. Bureau of Mines, increased 2 percent over the output for April, 1949. Mill shipments reached 18,375,000 barrels during the month—3 percent above the April, 1949, total, while stocks of 22,918,000 barrels on April 30 were approximately the same as the April 1949, totals. Clinker output in April, 1950, was 18,086,000 barrels, or 4 percent above the figure for the corresponding month of the previous year.

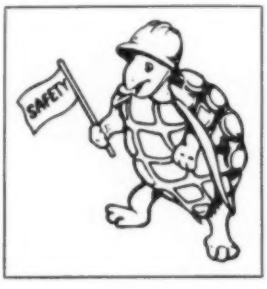
PRODUCTION—A total of 148 plants, located in 35 states and Puerto Rico, produced 18,088,000 barrels of finished cement during April, 1950. In the same month of 1949, 17,682,000 barrels were produced in 148 plants. Clinker production was up 4 percent over the April, 1949, total.

SHIPMENTS—Mill shipments were 18,375,000 barrels, a figure 3 percent greater than that reported for April, 1949. The demand for cement in April, 1950, as indicated by mill shipments, increased substantially over that of the previous month (March, 1950) when 14,613,000 barrels were shipped. Shipments were greater in 11 districts and smaller in 8 districts, than those recorded for April, 1949. The percentage changes range from a decrease of 31 percent in the Illinois district to an increase of 29 percent in the Alabama district. Shipments in the Puerto Rican district increased 14 percent in April, 1950.

STOCKS—Finished cement stocks on April 30 amounted to 22,918,000 barrels—0.3 percent below the April, 1949, figure, while clinker stocks as of the same date totaled 8,470,000 barrels—an increase of 12 percent.

Turtle Club Idea not Slow In Catching on—for Safety

A newly-organized group formed recently by employees of the E. D. Bullard Company, 275 Eighth Street, San Francisco, Calif., is the Turtle Club, whose emblem is reproduced below. By emulating the turtle in its efforts to gain self-protection, Turtle Clubbers hope to encourage the wearing of head protection among workers exposed to falling objects. Their slogan, "Shell on head—we're not dead", aptly expresses the organization's significant contribution to industrial safety efforts.



Application blanks may be obtained from the Bullard Company, and full information will be sent.

Net profit of Canada Crushed Stone, Ltd., Toronto, Ont., for 1949 totalled $166,099, as compared with $170,115 in the previous year. Balance sheet figures reveal current assets of $857,627 and current liabilities of $126,642, as compared with $666,451 and $113,552, respectively, in the previous year.

Semline Corp. Building Portland Cement Plant For Philippine V.P. Lopez

South of Iloilo City on the island of Quimaras, Philippine Islands, a 500-bbl. per day wet process portland cement plant is presently being erected for Vice President Fernando Lopez by The Semline Corporation of Washington, D. C.

According to William MacPherson, construction engineer for Semline, the work of clearing the site of coconut trees and other tropical growth, grading, and construction of foundations has been under way for the last six or seven months. He states that the plant, designed by George Powell of Semline, is expected to be ready for operation by September 1.

Excavation for the limestone crushing and screening plant was begun recently, and construction of the powerhouse is also in progress. Installation of three diesel engines—1,000 hp., 500 hp., and 100 hp.—will be timed for completion before the annual rains begin. Mr. MacPherson reported that the pouring of foundations for the raw grinding and finish grinding mills is also slated for an early "must," and that the housing for the kiln, the dust chamber, and the pump house will be installed immediately thereafter.

Quimaras is described as "composed of shell and coral limerock hills," with valleys composed of silical limestone clays assuring an unlimited supply of high-grade raw material for the cement plant.

• William MacPherson and finny victim.

Mr. MacPherson, before his association with Semline, was superintendent for the following concerns: United Clay Mines Corporation, Hawthorne, Fla.; Florida Rock Products, Brooksville, Fla.; and Virginia-Carolina Chemical Company, Mining Division, Richmond, Va.

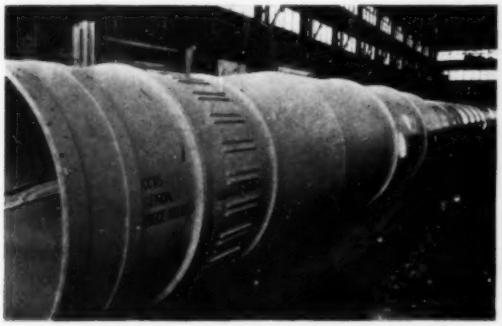
Italian Cement Plants Get Kennedy-Van Saun Equipment

The Kennedy-Van Saun Manufacturing and Engineering Corporation, New York, N. Y., is supplying large quantities of equipment for the construction of several new cement plants in Italy and for the improvement and expansion of others. The Italcementi Company, largest producer in Italy, is installing at its Trento plant complete new crushing and raw-grinding departments and a 9½- by 11- by 340-ft. kiln with cooler and recuperator. At is Calusco plant a complete new crushing and screening department and a new clinker mill with classifiers is being added.

Calci e Cementi de Segui is installing a complete new Kennedy dry-process plant, including a crushing and drying department, raw-and-clinker-grinding departments, and kiln department. The 9 ft. 8-in. by 8- by 9- by 230-ft. Kennedy rotary kiln and the 7 ft. 5-in. by 85-ft. cooler both have recuperators. An air-swept tube mill will direct fire the kiln with coal.

• Below, left: The 9 ft. 8-in. by 8- by 9- by 230-ft. kiln which has been shipped to Calci e Cementi de Segui in Italy by the Kennedy-Van Saun Manufacturing and Engineering Corp., New York, N. Y.

• Below, right: The 7- by 40-ft. three-compartment clinker grinding tube mill shipped by K.V.-S. to the same Italian plant.



Canadian Asbestos Mines Modernize Methods, Setups, Install New Equipment

Gleaned from the *Canadian Mining and Metallurgical Bulletin* are the following notes concerning asbestos operations in Canada:

The Johnson's Company Ltd., Thetford Mines, Que., which is preparing its second lift of blocks for production and also installing an underground crusher, will draw its new ore from concrete scram drifts with 50-hp. slusher hoist into 140-cu. ft. cars, delivering to a 42-in. by 48-in. crusher.

Canadian Johns-Manville Company's mine at Asbestos, a 10,000-ton-per-day operation, will use 125-hp. slusher hoists, 200-cu. ft. cars, rotary tipples, and 48-in. by 60-in. underground jaw crushers.

Plans of the *United Asbestos Corporation, Ltd.*, include development from a vertical shaft; room-and-pillar shrinkage stoping; 50-hp. scraper layout; and belt-conveying to the mill site up an 18-degree inclined shaft.

Turner and Newall's Bell mine is being prepared for block caving. It is now the sole open-pit operation on the main Thetford deposit.

4th Universal Atlas Well At Independence Hits Oil

Drilling of the No. 4 well at the Universal Atlas Cement Company's quarry at Independence, Kan., recently hit oil at 1,340 ft. Local oil men stated that the well could produce 100 bbls. per day, but that it would probably be choked to about 50 bbls.

It was indicated that the latest well on the Atlas holdings had been drilled a short distance east of the other three wells, at the eastern edge of the quarry. The earlier wells, drilled in last year; are said to be holding up in production.

Penn-Dixie Cement Installs 500-ft. F.L. Smidth Kiln

Pennsylvania-Dixie Cement Corporation's expansion plans at Kingsport, Tenn., include the addition of a Smidth wet-process kiln described as "the largest and longest kiln in either North or South America".

The 500-ft. kiln will be used in place of the present six dry kilns. Cost of the new installation will be more than $2,100,000.

L. S. Hackney Elected President of Association Of Illinois Limestone Men

A recently formed nonmetallic minerals producers' organization in the Midwest is the Northern Illinois Limestone Producers Association, which elected officers and formulated working plans on March 18.

Officers of the new organization, numbering 19 member companies, are as follows: president L. S. Hackney, Davis Junction, Ill.; vice-president, Russ Ruffner, Plainfield, Ill.; secretary-treasurer, William Seitz, Oregon, Ill. The board of directors includes the following, in addition to the three above-named officers: Lourde Renner, Sterling, Ill.; Clarence Griffiths, South Beloit, Ill.; Charles Willrett, Malta, Ill.; and Arthur R. Larson, Lena, Ill.

Mr. Hackney states that Clint Allen, executive secretary of the Iowa Lime Association, assisted the founding members in organizing the new association. He adds that equipment dealers, manufacturers, explosives engineers and others interested in the limestone producing business will be invited to become associate members.

Geological Institute Launched On Significant Service Career

"Coordination, cooperation, and service" is the three-fold watch-word of the American Geological Institute, a recently formed organization now operating as an affiliate of the National Research Council. Establishment of the institute, announced in the June issue of PIT AND QUARRY (page 51), furnishes "central representation for the geological sciences in all matters which are of interest to the entire profession." A.G.I. fulfills much the same functions for the geological sciences as does the American Institute of Physics for the field of physics. Our initial announcement contained the names of the founding member societies.

Additional information on the setup of the new organization indicates that non-profit groups of a regional or local nature may join the institute as affiliates. This group may include professional or amateur groups or local, state, and regional non-profit organizations of operators, owners, and managers of mining, quarrying, or other types of mineral operations.

A third class of membership includes organizations, corporations, or companies designated as associates. These contribute to the support of the institute because of their interest in geological science and its applications.

The formation of such a body was discussed in 1942, when the demands of World War II demonstrated the need for an organization to serve the geological sciences. Assistance was offered by the National Research Council in 1947, and headquarters were established in the N.R.C. building in June, 1949. First president is William B. Heroy, executive vice-president of the Geotechnical Corporation, Dallas, Tex.

The institute is currently issuing to industry, instructors, and students a series of reports of interest to professional and amateur geologists. It is also publishing a monthly news letter. Full information concerning the institute and its activities, and a current financial statement, are available upon application to David M. Delo, executive director, American Geological Institute, 2101 Constitution Avenue, N.W., Washington 25, D. C.

Pit and Quarry Scheduled For Microfilm Editions

PIT AND QUARRY, 538 South Clark Street, Chicago, Ill., has entered into an agreement with University Microfilms, Ann Arbor, Mich., to make available to libraries issues of PIT AND QUARRY *and the* CONCRETE MANUFACTURER in microfilm form.

The use of microfilm permits the production and distribution of periodicals on the basis of an entire volume in a single roll in editions of 30 or more, at a cost approximately equal to that of binding the same material in a conventional library binding.

By means of this plan the library keeps the printed issues unbound and circulates them in that form for a period of two or three years, after which they are disposed of and the microfilm is substituted.

Sale of the microfilms is restricted to subscribers, and the film copy is distributed at the end of the volume year. The microfilm is printed black on white and is furnished on metal reels, suitably labeled. Inquiries should be directed to the University Microfilms, 313 N. First Street, Ann Arbor, Mich.

Cover Picture....

● An aerial view of the Halliburton Portland Cement Company's mill at Corpus Christi, Tex. This new plant, which has a reported daily capacity in excess of 4,000 bbls., went into production several months ago. Raw materials, consisting of oyster shells and clay, are brought in by barge from nearby Nueces Bay. The packhouse and silos flank a 300-ft. dock on the ship channel in the background.

Ideal Cement Co. Leases Site in New Orleans For Storage-Packing Plant

At New Orleans, La., an important transaction has been revealed in which the Ideal Cement Company of Denver, Colo., took a 25-year lease on a site for the construction of a $500,000 storage and packing plant. It was stated that the area lies between Highway 90 and Lake Pontchartrain on the Industrial Canal.

Company spokesmen indicated that the new facilities would include a wharf for unloading cement to be brought in from the Mobile, Ala., plant in self-unloading barges; a sacking plant; a storage building with six silos, capacity 100,000 barrels; and administrative offices.

Ideal now has 11 plants in eight states and serves customers in 27 states. The proposed plant at New Orleans will be used principally in developing the company's export trade, according to C. K. Boettcher, president. It is scheduled to go into operation in September or October.

Mineralogical Dictionary Published by Brooklyn Firm

The Mineralogical Dictionary, an 87-page, illustrated work published by the Chemical Publishing Company, Brooklyn, N. Y., contains concise definitions of more than 1400 mineralogical terms. Listed also are the chemical composition, crystal form, physical, chemical properties, and occurrences of minerals. The 40 plates show about 200 minerals in their original colors.

The dictionary should be most valuable to geologists, mineralogists, metallurgists, jewelers, and chemists, as well as those who use minerals and materials of mineralogical origin. Price: $4.75.

Delivered Pricing Bill Vetoed by President Truman

President Truman on Friday, June 9, vetoed the Delivered Pricing Bill S. 1008, which would have permitted cement and other manufacturers to absorb freight charges and sell at uniform delivered prices. This so-called "basing point" bill would have ended the general perplexity which has existed in industry since the Supreme Court, effective July 9, 1948, outlawed the multiple-basing 1-point delivered price system.

On June 2, 1949, after nearly two years of deliberation, Congress finally passed this bill. It had been generally believed that the President would sign it and his action in vetoing it came as a distinct surprise.

To meet the rising demand for granite roofing granules, the Minnesota Mining and Manufacturing Company, St. Paul, Minn., recently set up a plant on the Pine Bluff Highway, near Little Rock, Ark. Title to 450 acres on the north half of Allis Mountain was acquired by the Big Rock Stone & Material Company of Little Rock.

Strong Action Urged By President Truman To Cut Job Accidents

The accompanying photograph shows President Truman being welcomed at the opening session of the President's Conference on Industrial Safety, in which he called for redoubled effort to achieve a 50 percent reduction in industrial accidents by 1952. The conference held a three-day session in the Departmental Auditorium, Washington, D. C., June 5-7.

President Truman told the audience: "So far as this conference is concerned, I want it to become the strongest possible organization of cooperating agencies, public and private, dedicated to the prevention of job injuries. I believe its committees should function the year round to survey safety problems and to develop recommendations for their solution. I want these committees to help apply their recommendations to every work place in the nation. I hope that every organization represented at this conference will give serious study to your recommendations and will do its best to put them into effect."

At the conclusion of the conference Vincent P. Ahearn, N.S.G.A. executive secretary, was presented with a special Award of Merit by Secretary of Labor Maurice J. Tobin for his valuable contribution to the success of the conference.

There were more than 1,000 delegates from the 48 states in attendance.

• Secretary of Labor Maurice J. Tobin, general conference chairman; President Truman; William L. Connolly, director of the Bureau of Labor Standards; and Vincent P. Ahearn, N.S.G.A. executive secretary and conference executive director.

16 Lime Plants Win Awards In N.L.A. Safety Contest

The National Lime Association has announced that 16 lime plants have won awards in the 1949 annual N.L.A. safety competition. This is the largest number of plants winning prizes during any single year in the 15-year history of the contest.

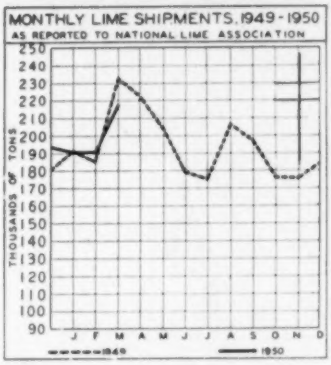
Winners in the various categories of the contest had their records verified by the Bureau of Mines as having operated during the year without a lost-time injury. They are as follows:

Group (A)—quarry and calcining plants working 100,000 or more man-hours: Cedar Hollow plant of The Warner Company, York plant of National Gypsum Company, Natividad plant of Kaiser Aluminum & Chemical Corporation, Evans plant of United States Gypsum Company.

Group A—quarry and calcining plants working less than 100,000 man-hours: Thomasville plant of The J. E. Baker Company, Berkeley plant of North American Cement Corporation, Ripplemead plant of Ripplemead Lime Company, Thomaston plant of Lawrence Portland Cement Company, Frederick plant of Shank & Etzler Lime Company.

Group B—underground mine and calcining plants: Bellefonte plant of National Gypsum Company, Bakerton plant of Standard Lime and Stone Company, Hannibal plant of Marblehead Lime Company, Marblehead plant of Marblehead Lime Company.

Group C—lime calcining plants without associated quarry or mine: Thornton plant of Marblehead Lime Company, Plymouth Meeting plant of Philip Carey Manufacturing Company, Houston plant of Nyotex Chemicals, Inc.



According to data collected by the National Lime Association, 48 companies in March, 1950, shipped 217,591 tons of lime (136,989 quicklime; 80,602 hydrate). Reporting companies represent 60.1 percent of the association members' total capacity of record. Based on Pit and Quarry's estimate for the remainder of the industry, the total shipments were approximately 398,000 tons. Shipments by uses and grades for March, 1950, were:

	Quicklime	Hydrate
Agricultural	2,699	15,112
Quicklime	13,998	36,986
Chemical	120,292	28,504
Total	136,989	80,602

• The accompanying photographs show one of two new 11- by 40-ft. kilns which have been shipped by F. L. Smidth & Company of New York to the Heracles plant of the General Cement Company at Piraeus, Greece. The kiln was shipped knocked down in 10 cylindrical sections, as shown on freight cars (above). The illustration at the right shows a section in place on the deck of the ship.

Giant Portland Cement Co. Appoints R. O. Bartholomew To Post of Chief Engineer

R. O. Bartholomew, consulting engineer of Houston, Tex., has been appointed chief engineer of the Giant Portland Cement Co. and its subsidiary, Carolina Giant Cement Company. Mr. Bartholomew assumed his new duties on May 1.

A graduate of Texas A. & M. College in mechanical engineering, Mr. Bartholomew joined the engineering department

R. O. Bartholomew

of the Trinity Portland Cement Company in 1926. He served as chief engineer for Trinity during the construction of the Houston plant and the enlargement of the Fort Worth plant. Later he made extensive industrial engineering studies in the various plants of the company.

In 1941 Mr. Bartholomew was appointed superintendent of the Houston plant. Five years later he entered the consulting engineering field, devoting his interests largely to work for various cement companies.

Mr. Bartholomew is currently located at the Harleyville plant of the Carolina Giant Cement Company. He is a top-flight amateur golfer.

Carlsbad Firms Announce Large-Scale Expansion Plans

Nelson White, assistant manager at Carlsbad, N. M., for the International Minerals & Chemical Corporation, recently announced that the concern plans a $1,500,000 expansion project. At the same time the new Duval Sulphur & Potash Company announced proposed new installations.

A major part of the International program will be a 1,000-ft. shaft tying into present mining operations which will be used to transport men and equipment.

Page Morris, general superintendent for Duval, stated that the firm will soon start two 1,500-ft. shafts to potash deposits. He esstimated that the cost would exceed $1,000,000.

Progress in Milling, Control Of Dust at Canadian Mills

At the British-Canadian Mine of the Asbestos Corporation mill capacity has been virtually doubled without interrupting production. This was accomplished by the erection of a new rock mill which also houses dust control units, while at the same time converting the old mill into a fiber mill. The gradual changeover also included new crushing and drying installations. With both units of the new primary mill in full operation, this plant will handle approximately 6,000 tons of rock per 24-hour day.

The Johnson's Company Thetford mine has an interesting milling development, a wet-process fiber recovery unit which currently treats between 20 and 30 tons per hour of old mill tailings and turns out satisfactory grades of fiber.

To improve dry-milling operations at the Bell mine of Turner and Newall, a central fan station was installed in connection with the dust control system.

Buell Acquires Rights To "SF" Dust Precipitator

Rights to manufacture and sell the Swedish "SF" electrical dust precipitator in this country have been acquired by Buell Engineering Company from Svenska Flaetfabriken subsidiary of ASEA (Swedish General Electric Company), it was announced recently.

Though the SC precipitator is new to this country, it has been sold in world markets for 18 years; 150 installations are now being operated in 11 countries, on all types of valuable and nuisance dusts.

With the SF, Buell now offers a complete line of dust collection systems, including high-efficiency cyclones and low-draft-loss baffle type collectors. Buell is now in a position to meet all operating conditions and efficiency requirements.

• President Edstrom (Svenska Flaektfabriken) hands the contract to Joseph Messenger (Buell Engineering Co. vice-president) as J. H. Nicholls (Buell treasurer) looks on.

S. Dakota Cement Plant Overhauls Equipment, Prepares to Open Addition

At Rapid City, S. D., the closing of the South Dakota Cement Plant on May 1 for three weeks marked the beginning of extensive overhauling operations on all equipment—the first such checking in four years.

Frank Gardner, general manager, stated that the shut-down was necessary for inspecting and reconditioning equipment, in order to tie in previous operations with the opening of the new section, then nearing completion. He pointed out that the accumulation of a 200,000-bbl. backlog of cement precluded the danger of a shortage.

The $1,500,000 addition, scheduled for operation by June 1, will more than double the plant's former output; it will turn out about 4,500 bbls. per day.

Limestone Products Co. Adds New Kiln to Make Lime

A. T. Lohman, president of the Limestone Products Company has announced that quicklime and hydrated lime will soon be produced at the firm's plant near Cleburne, Tex.

Addition of a specially designed rotary kiln with an output of 150 tons daily will bring the total cost of the plant and quarry installations to approximately $1,100,000. Limestone is quarried from a 50-acre, 118-ft. hill. Mr. Lohman stated that the new kiln will be in service within three months.

The Limestone Product Company began operations two years ago, crushing, screening, and handling stone for various agricultural and industrial uses.

• In the accompanying photograph O. L. Staggs (left) safety director of the Lone Star Cement Corporation, receives a Certificate of Appreciation from Mason H. Bigelow, president of the National Society for the Prevention of Blindness, in recognition of Lone Star's work in fostering the growth of the Wise Owl Club of America. Mr. Staggs was given the certificate at the "Mobilization to Prevent Blindness" meeting of the N.S.P.B. in New York. To become a member of the Wise Owl Club, a worker must submit his smashed or burned goggles as proof that they saved him from partial or complete blindness. The pin which he receives is worn to identify him as a member and to remind him and his fellow workers that goggles should be worn at all times while on the job.

Safety Trophies Awarded In 1949 Safety Competition

The close of the first quarter-century of the National Safety Competition conducted annually by the U. S. Bureau of Mines, was marked by the award of "Sentinels of Safety" trophies (signifying outstanding safety achievements during 1949) to the leading contenders in six classes of mineral operations.

Dr. James Boyd, Bureau of Mines director, announced the award of 133 Certificates of Achievement in Safety to mines, quarries, and open pits which finished second, third, fourth, and fifth in their respective classes, or which operated 30,000 or more man-hours during the year and did not have a lost-time injury. The injury-free plants marked up a total of 15,787,070 man-hours of exposure to hazards.

Perfect safety records were achieved by 202, or nearly a third of the 646 mineral operations enrolled in the 1949 competition. Of the injury-free plants, however, 68 worked fewer than 30,000 man-hours and so failed to meet the minimum requirement for a certificate award. The total enrollment during 1949 was the highest in the 25-year history of the competition, and contrasts with a total enrollment of 210 plants in 1925.

During 1949 the injury-severity rate of all competing plants was 5.56 days lost per 1000 man-hours of work. This was the lowest by a substantial margin in the 25-year history of the competition, and about 35 percent below the 1925 rate of 8.49. The injury-frequency rate—33.21 lost-time injuries per million man-hours—was the second lowest in the history of the competition, and 67 percent better than the 1925 rate of 100.09. The best frequency rate—33.02 per million man-hours—was achieved in the 1940 competition.

The 1949 awards brought the total number of awards of the "Sentinels of Safety" trophies to 136 and the number of the Bureau's Certificates of Achievement to 1,896. In recognition of the part played by employees in preventing accidents, the Bureau presents a Certificate of Accomplishment in Safety to each employee of a trophy-winning establishment. About 1,200 certificates will be awarded for 1949, bringing the 25-year total to about 30,000.

Plants enrolled in the 1949 competition worked a total of 146,385,713 man-hours. This compares with 68,418,283 man-hours worked by operations entered in the initial competition 25 years earlier.

Award of the "Sentinels of Safety" trophies, donated by the *Explosives Engineer Magazine*, and of the Certificates of Achievement in Safety, is based upon tabulation of injury records of competing anthracite and bituminous-coal mines, metallic and nonmetallic minerals mines, open-pit mines, and quarries. The trophies are retained for a year, and are transferred when new winners have been determined the next year.

The National Safety Competition is designed to promote safety in the country's mineral industries, Director Boyd explained. It gives management and labor an opportunity to work together to make accident-prevention activities at the mine or quarry more effective.

Enrollment in the competition is entirely voluntary, the Director emphasized. He added that applications for the 1950 competition are still being taken. Applications for enrollment and rules for the current contest may be obtained by writing to the Accident Analysis Branch of the Bureau of Mines, Washington 25, D. C.

The nonmetallic minerals trophy winners are as follows:

Underground nonmetallics mines: The Bellefonte mine of the National Gypsum Company at Bellefonte, Centre County, Pa., for working 234,618 man-hours without a lost-time injury.

Stone quarries: Dolonah quarry of the Tennessee Coal, Iron & Railroad Company at Bessemer, Jefferson County, Ala., for working 285,223 man-hours without a lost-time injury.

The following operations won the Bureaus' Certificate of Achievement in Safety for injury-free records or for ranking second, third, fourth and fifth in their respective groups of the 1949 National Safety Competition:

Sugar Creek limestone and shale mine, Sugar Creek, Mo., Missouri Portland Cement Co.

Bakerton limestone mine, Bakerton, W. Va., The Standard Lime & Stone Co.

Crestmore limestone mine, Riverside, Calif., Riverside Cement Co.

Winnfield salt mine, Winnfield, La., The Carey Salt Co.

Number 3 shale mine, Hannibal, Mo., Universal Atlas Cement Co.

Crystal City sand mine, Crystal City, Mo., Pittsburgh Plate Glass Co.

Modern Equipment Ups Brazilian Gypsum Mine's Output by 129 Percent

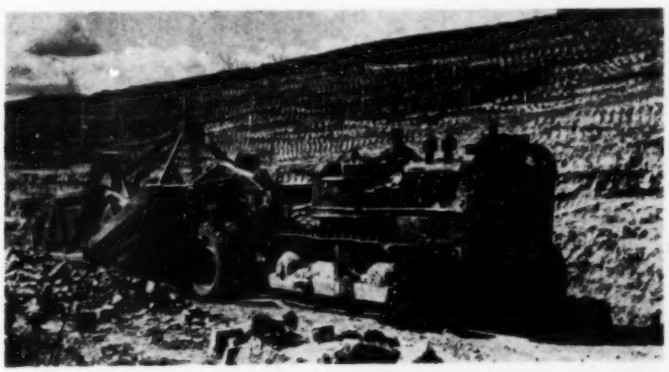
Introduction of modern surface mining practices have recently set new records of production and safety in a South American gypsum mine. A few months ago a new Allis-Chalmers HD-19 tractor and a Gar Wood scraper were delivered to the Mineracao Rosado gypsum mine near the eastern most tip of South America in the Brazilian state of Rio Grande Do Norte.

Before the arrival of modern earth-moving equipment Mineracao Rosado, located near the city of Mossoro, depended chiefly on 250 burros and 600 men. During a seven-month season, they produced about 24,000 metric tons of gypsum.

After the HD-19 and the 24-cu. yd. scraper were delivered, production increased 129 percent, from 24,000 to 55,000 metric tons per season. The 250 burros were dismissed, and labor costs were greatly reduced.

According to "Cobrama", Allis-Chalmers dealer at Recife, Brazil, the overburden removed by the tractor and scraper is a hard-pan-like substance, particularly near the gypsum strata. The haul route is about 1,000 ft., and the tractor is working 21 hours per day, seven days a week.

Even more significant than these startling production records is the reduction in casualties. Previously, Mineracao Rosado operations were regularly beset with accidents, due principally to landslides. Since the tractor-scraper team came on the job, not a single man has been lost, although production has more than doubled. Hand labor is still used extensively to discover and select the different qualities of gypsum to be mined.



• Since the above tractor and scraper have been delivered to the Mineracao Rosado gypsum mine in the Brazilian state of Rio Grande Do Norte production has increased 129 percent.

Akron gypsum mine, Clarence Center, N. Y., Certain-teed Products Corporation.

Charmian trap rock mine, Charmian, Pa., The Funkhouser Co.

Frankfort limestone mine, Frankfort, Ky., Frankfort Builders Supply Co., Inc.

Acme gypsum mine, Acme, Tex., Certain-teed Products Corporation.

Fairmount slate mine, Fairmount, Ga., The Funkhouser Co.

Open-Pit Mines

Monsanto phosphate rock mine, Columbia, Tenn., Monsanto Chemical Co.

Bonny Lake phosphate rock mine, Bartow, Fla., The Davison Chemical Corporation (Phosphate Rock Division).

Bonanza gilsonite mine, Bonanza, Utah, American Gilsonite Co.

Fort Bellefontaine limestone quarry, St. Louis, Mo., Missouri Portland Cement Co.

Hanover limestone quarry, Hanover, Pa., Bethlehem Steel Co.

Number 4 cement rock quarry, Nazareth, Pa., Pennsylvania-Dixie Cement Corporation.

Southwestern limestone quarry, Osborn, O., Southwestern Portland Cement Co.

Bailey Falls limestone quarry, Oglesby, Ill., Marquette Cement Manufacturing Co.

Naginey limestone quarry, Naginey, Pa., Bethlehem Steel Co.

Number 5 limestone quarry, Hannibal, Mo., Universal Atlas Cement Co.

Hagerstown limestone quarry, Hagerstown, Md., North American Cement Corporation.

LeRoy limestone quarry, LeRoy, Pa., The General Crushed Stone Co.

St. Louis Work House lime quarry, St. Louis, Mo., City Administration Co.

Cedar Hollow lime quarry, Devault, Pa., The Warner Co.

St. Stephens limestone quarry, St. Stephens, Ala., Lone Star Cement Corporation.

Dixon limestone quarry, Dixon, Ill., Medusa Portland Cement Co.

Number 3 limestone and shale quarry, Richard City, Tenn., Pennsylvania-Dixie Cement Corporation.

Natividad dolomite quarry, Salinas, Calif., Kaiser Aluminum & Chemical Corporation.

Clinchfield limestone quarry, Clinchfield, Ga., Pennsylvania-Dixie Cement Corporation.

Catskill cement rock quarry, Catskill, N. Y., Alpha Portland Cement Co.

Fogelsville cement stone and limestone quarry, Fogelsville, Pa., Lehigh Portland Cement Co.

York limestone quarry, York, Pa., National Gypsum Co.

Bethlehem limestone quarry, Bethlehem, Pa. Bethlehem Steel Co.

Portland limestone and shale quarry, Portland, Fremont County, Colo., Ideal Cement Co.

Oglesby limestone quarry, Oglesby, Ill., Lehigh Portland Cement Co.

Hudson limestone quarry, Hudson, N. Y., Universal Atlas Cement Co.

Stockertown cement rock quarry, Stockertown, Pa., Hercules Cement Corporation.

Nazareth cement rock quarry, Nazareth, Pa., Lone Star Cement Corporation.

Northampton cement rock quarry, Northampton, Pa., Universal Atlas Cement Co.

Bath cement rock quarry, Bath, Pa., Keystone Portland Cement Co.

Greencastle limestone quarry, Greencastle, Ind., The Ohio & Indiana Stone Corporation.

Earlham limestone quarry, Earlham, Iowa, Marquette Cement Manufacturing Co.

Gay limestone and shale quarry, Fordwick, Va., Lehigh Portland Cement Co.

Permanente limestone quarry, Permanente, Calif., Permanente Cement Co.

Jensen limestone quarry, Riverside, Calif., Riverside Cement Co.

Ormrod limestone and cement stone quarry, Ormrod, Pa., Leigh Portland Cement Co.

LaSalle cement rock quarry, LaSalle, Ill., Alpha Portland Cement Co.

Jordanville limsetone quarry, Jordanville, N. Y., The General Crushed Stone Co.

Birmingham limestone quarry, Birmingham, Ala., Lone Star Cement Corporation.

Rock Hill trap rock quarry, Quakertown, Pa., The General Crushed Stone Co.

Petoskey limestone quarry, Petoskey, Mich., Petoskey Portland Cement Co.

White Haven sandstone quarry, White Haven, Pa., The General Crushed Stone Co.

Klondike limerock quarry, Oro Grande, Calif., Riverside Cement Co.

Dallas limestone quarry, Dallas, Tex., General Portland Cement Co. (Trinity Portland Cement Div.).

Auburn limestone quarry, Auburn, N. Y., The General Crushed Stone Co.

Thomaston limestone quarry, Thomaston, Me., Lawrence Portland Cement Co.

Spencer crushed stone quarry, Spencer, Ind., France Stone Products, Inc.

National City gypsum rock quarry, National City, Mich., National Gypsum Co.

Huntington limestone quarry, Huntington, Ind., The Erie Stone Co.

Mitchell and Brownstown limestone and shale quarry, Mitchell and Brownstown, Ind., Lehigh Portland Cement Co.

Sandt's Eddy cement rock quarry, Easton, Pa., Lehigh Portland Cement Co.

Dallas limestone quarry, Dallas, Tex., Lone Star Cement Corporation.

West Conshohocken limsetone quarry, West Conshohocken, Pa., Valley Forge Cement Co.

Bellevue limestone quarry, Bellevue, O., The France Stone Co.

Fredonia limestone quarry, Fredonia, Kans., Consolidated Cement Corporation.

Bloomville limestone quarry, Bloomville, O., The France Stone Co.

Mason City limestone and shale quarry, Mason City, Iowa, Lehigh Portland Cement Co.

Ohio dead burned dolomite quarry, Millersville, Ohio, The J. E. Baker Co.

Davenport limestone quarry, Davenport, Iowa, Dewey Portland Cement Co.

Middlefield No. 1 crushed trap rock quarry, Middlefield, Conn., The New Haven Trap Rock Co.

Okay annona chalk quarry, Okay, Ark., Ideal Cement Co.

Zanesville limestone quarry, Zanesville, Ohio, Sidwell Brothers Co.

Sylvania limestone quarry, Sylvania, O., Medusa Portland Cement Co.

Phillipsburg limestone quarry, Phillipsburg, Ohio, The Laura Gravel & Stone Co.

Martha limestone quarry, Martha, Tenn., Marquette Cement Manufacturing Co.

Holston crushed limestone quarry, Mascot, Tenn., American Limestone Co.

Superior limestone quarry, Superior, Nebr., Ideal Cement Co.

Number 3 cement rock quarry, West Coplay, Pa., Coplay Cement Manufacturing Co.

Winterset limestone quarry, Winterset, Iowa, Pennsylvania-Dixie Cement Corporation.

Evans limsetone quarry, Evans, Wash., United States Gypsum Co.

Marquette limestone quarry, Cape Girardeau, Mo., Marquette Cement Manufacturing Co.

Iola limestone and shale quarry, Iola, Kans., Lehigh Portland Cement Co.

Leona basalt-crushed rock quarry, Oakland, Calif., Heafy-Moore Co., Sales Division of Gallagher & Burk, Inc.

Fort Worth limestone quarry, Fort Worth, Tex., General Portland Cement Co. (Trinity Portland Cement Div.).

New Braunfels lime quarry, New Braunfels, Tex., United States Gypsum Co.

Charmian trap rock quarry, Charmian, Pa., Funkhouser Co.

Tobey high-calcium stone quarry, West Stockbridge, Mass., Lee Lime Corporation.

St. Louis cement rock quarry, Lemay, Mo., Alpha Portland Cement Co.

Howes Cave limestone quarry, Howes Cave, N. Y., North American Cement Corporation.

Union Bridge limestone quarry, Union Bridge, Md., Lehigh Portland Cement Co.

Alsen limestone quarry, Alsen, N. Y., Lehigh Portland Cenemt Co.

Montgomeryville trap rock quarry, Montgomeryville, Pa., Montgomery Stone Co.

Spearfish limestone rock and dust quarry, Spearfish, S. Dak., Cole Construction Co.

Elberton monumental stone quarry, Elberton, Ga., Oglethorpe Granite Quarry Co.

Princeville agriculture stone and crushed rock quarry, Princeville, Ill., La Mar Stone Co.

Medusa limestone quarry, York, Pa., Medusa Portland Cement Co.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

FEATURED in the July, 1920, issue of PIT AND QUARRY was an address made before the convention of one of the important nonmetallic minerals industries. *Lime Industry in Perspective* was the title of the address given before the convention of the National Lime Association by President Charles Warner (The Warner Company). He pointed out that the first year of association work had shown the need for decentralization of some of the association's activities, particularly in promoting the agricultural market for lime. The second year proved that this was an effective method of operation. He suggested the formation of warehousing corporations, financed jointly by the producers in a given area, which would make possible the storage of enough lime to meet agricultural needs during the liming seasons.

In a letter to the editor, Otho M. Graves, assistant to the president of the General Crushed Stone Company, Easton, Pa., outlined a plan of industrial relations which had been submitted to the workers of its nine plants. This plan had the following provisions, the first three of which were already in operation: (1) That every employee is entitled to a fair share of the company's profits; (2) That the employees also have a right to a voice in the management of the plants; (3) That the conditions under which an employee works should be made as pleasant and comfortable as the nature of his work permits; (4) That a man should be paid even though he is sick and unable to work; (5) That employees paid an hourly rate should be paid for time lost due to conditions beyond their control.

It was pointed out by Mr. Graves that acceptance of the above principles carried with them moral obligations on the part of the employees. If they share in the profits, they should strive wholeheartedly to produce such profits; if they are paid for time not worked, they should not expect extra pay when occasional overtime work is required.

An address before the National Lime Assn. convention by Edith J. Munsell gave some interesting satistics of the lime industry. These showed a decrease in lime production from over 4,000,000 tons in 1916 to slightly over 3,000,000 tons in 1918. It was also shown that the use of lime for agriculture dropped from 15 percent of the total to 12 percent; that its use in construction dropped from 37 to 29 percent, while chemical lime rose from 48 to 59 percent of the total. Other statistics showed that the best possibilities for expanding the use of lime were apparently in the field of agriculture.

A news item told of five firms which had recently become members of the National Crushed Stone Association. Some of these are still in business and still active members, one having contributed two presidents of the association. These firms were the Weston & Brooker Co., Columbia, S. C.; H. E. Fletcher Co., West Chelmsford, Mass.; The Morris County Crushed Stone Co., Morristown, N. J. The Ohio Marble Co., Piqua, O.; The Higgins Stone Co., Belleville, O.

Association activities described in this issue included the annual meeting of the Michigan Sand and Gravel Producers' Association at Detroit. Officers elected were as follows: president, C. N. Ray; vice-president, G. A. Glarum; secretary and treasurer, George L. Earle.

Blast-Furnace Slag Output Shows Increase in 1949

A new record output of 21,581,379 short tons, valued at $24,578,712, was established by the iron blast-furnace slag processing industry in 1949. These figures were obtained from a canvass conducted by the National Slag Association in cooperation with the U. S. Bureau of Mines. Included is the output of 66 plants (41 companies) processing air-cooled slag and 10 plants (7 companies) processing expanded slag.

Screened air-cooled slag, the major product, amounted to 17,769,330 short tons, valued at $21,090,445. Of this total 15,879,737 short tons, or 89 percent were used as railroad ballast, aggregate for portland cement concrete, in bituminous and for other types of highway construction. The manufacture of mineral wool and the use for roofing, concrete block, airport construction, agricultural, sewage trickling filter medium, and miscellaneous uses consumed the balance.

Unscreened air-cooled slag processed during the year totaled 727,595 short tons, valued at $372,727, both slightly in excess of the 1948 figures. As in former years, this material was consumed in highway construction (other than in portland cement concrete and bituminous construction), railroad ballast, and for other uses.

The amount of granulated slag processed in 1949 increased substantially, while expanded slag declined, in comparison with 1948 totals. The consumption of granulated slag amounted to 1,885,428 short tons, about half of which was used in the manufacture of hydraulic cement. Slag processed as lightweight aggregate amounted to 1,199,026 short tons—11 percent below the 1948 total.

Canada Cement Co. Expects Most Active Year in 1950

Canada Cement Company officials held an optimistic view for the financial position of their firm, based upon forecasts of building volume for 1950. According to Trade Minister Howe, the most active year in history is predicted for construction during 1950.

As the largest producer in its field, accounting for nearly four-fifths of the total Canadian production, Canada Cement last year reported a new profit of $4,820,196, against the 1948 figure of $3,727,566. The company has largely completed its large expansion program, although some modernization and improvement work is still under way at various plants.

1st Quarter Profit-Sharing Distribution at 3M Plants

The largest sum ever distributed to employees in the 13-year history of the Minnesota Mining & Manufacturing Company's general profit sharing plan was paid to 6,540 workers recently.

Of the firm's first quarter (1950) profits, a total of $315,990 was set aside for distribution to employees at 28 plants and offices in 15 states. About 4,200 of those affected work at the main plant and offices here. The payment was the 53rd consecutive quarterly profit sharing distribution made by the company. The program is in effect for all permanent employees not participating in any other form of extra compensation.

Employee dividend payments are based on individual earnings for the quarter. Those with more than 30 months' service received checks for 7.2 percent of their total regular and overtime income for the first three months of 1950. Shorter-term workers received amounts based on their length of service.

$1,000,000 Expansion Plan Announced for Natl. Gypsum

The National Gypsum Company plans to spend over $1,000,000 for expansion, principally for new warehouse facilities at its plants in Clarence Center, N. Y., and in National City, Mich., as announced by President Melvin H. Baker.

Funds for the additional storage space are to be provided by the contemplated sale of 11,150 shares of the company's $4.50 cumulative preferred stock.

Proceeds from the sale, Mr. Baker said, will be divided about equally for the new facilities at both plants. Construction is scheduled to be started this summer and completed early next year. Mr. Baker said that the enlarged warehousing at the two plants is necessitated by the many new products the company has added to its line during the last several years.

WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

AT this writing the 81st Congress is grinding to a slow and uneventful close. No session of Congress in many years has been quite so devoid of action—even dull. As for its record of accomplishment, it didn't take many backward steps, but it did not take us very far forward.

Government Reorganization

One area where this Congress could have gone forward very far but did not concerns the recommendations of the Hoover Commission for reorganizing the government. Here the score looks pretty good. Of 32 plans for reorganization submitted, 22 were approved, 6 rejected, and 4 are still to be acted on. But before a conclusion can be drawn, it is necessary to look carefully at the plans which are rejected.

They include the proposed plan to reorganize the Agriculture Department. This was one of the most significant of the plans because next to the Defense Department, the Agriculture Department spends the greatest amount of money. But interests with very powerful Congressional connections saw to it that nothing was done to change the status quo.

The plans for reorganizing the Interstate Commerce Commission and the Federal Communications Commission also failed. Here, too, it appeared that the industries which are regulated by these commissions were more satisfied with things as they are, than as they might have been under a reorganized and presumably more efficient set-up. They openly and actively opposed these reorganizations and their positions prevailed.

The plan to reorganize the Treasury Department, which would have given the Secretary of the Treasury substantial authority over the Comptroller of the Currency also failed. This had opposition from banking and other business interests.

The defeat of the proposal to establish a new Welfare Department, whose head would be a Cabinet member, cannot be traced to the opposition of any particular group. Here there was much more generalized opposition originating in great part in Congress itself. The idea of a Welfare Department is unacceptable to many members of Congress who see in it the final surrender to a Welfare State. While the Federal Government does engage in many welfare activities, all of which are approved by Congress, there is still great reluctance to dignify these activities by giving their director Cabinet status.

The most bitterly contested of the reorganization measures was the one which dealt with the National Labor Relations Board. Contrary to the expectations of those who counted noses when the measure was first proposed, it was soundly beaten. The opposition to this measure appeared to gain strength as the debate over it proceeded. Its defeat is attributable to many reasons. Certainly the fact that it was regarded as a personal test of the strength of the Senate's leading Republican, Robert Taft, helped to gain the support of otherwise difficult senators. Also, the fact that it appeared to repeal a part of the Taft-Hartley Act by a roundabout method resulted in the active opposition of most business interests and of the conservative wing of the Democratic Party. If the record of the 81st Congress proved anything conclusively, it proved that the Taft-Hartley Act could not be repealed either by direct assault or by clever indirect methods.

By way of contrast, the plans which were approved appear to be of lesser significance. Generally, they involve only minor changes of authority.

For example, the powers of the chairman of the Civil Aeronautics Board, of the Securities and Exchange Commission, of the Federal Trade Commission and of the Federal Power Commission were increased. More centralization of authority was provided in the State, Justice, Labor and Defense Departments. The Commerce Department took over the Maritime Commission and the Bureau of Public Roads.

Still to be acted on are plans to change the accounting system of the Post Office and to alter its rate structure, and a plan to dismember the Reconstruction Finance Corporation. Its prefabricated housing loan and mortgage guarantee functions would go to the Housing and Home Finance Agency and its other functions to the Commerce Department.

All in all, the Hoover Commission proposals have not yet resulted in much streamlining. Many of the proposals have not been submitted to Congress by the President. Of those which have been submitted, many of them have met with serious opposition, particularly where there were powerful and articulate groups who felt that their interests were being prejudiced.

When the Hoover Commission was established, it was hoped that its bipartisan impartial character would mean that its proposals would have smooth sailing through Congress. This has been proved to be just another forlorn hope.

The New Look in Anti-Trust Actions

Recent anti-trust actions by the Justice Department are beginning to fall into a clearly definable pattern. The Justice Department appears to be attacking bigness by trying to make large companies give up some of their activities.

Thus, not so long ago, the Justice Department asked for a Court order to force the telephone company to give up its manufacturing operation carried on by Western Electric. In a somewhat similar action, several oil companies were used to give up their wholesale and retail outlets. The suit against A. & P. also attempts to get the company to give up many of its non-retailing activities. In these cases, the Justice Department was attacking the control of a business. It appeared to be operating on the theory that if the several phases of a business were under separate control, there would be more competition. But the Department did not try to dictate how much activity each part of the business should engage in.

It finally took that drastic step recently in the General Electric case. There the department wants a court order to force General Electric, which is the largest manufacturer of lamps in the country, to cut its production in half. If the Department wins this case, it will get an entirely new departure in anti-trust policy. The government will be in a position where it can prescribe the volume of output. Never, except in wartime has it been in that position. This case will no doubt be fought long and bitterly. It is unlikely that the outcome will be known for many years.

(*Continued on page 78.*)

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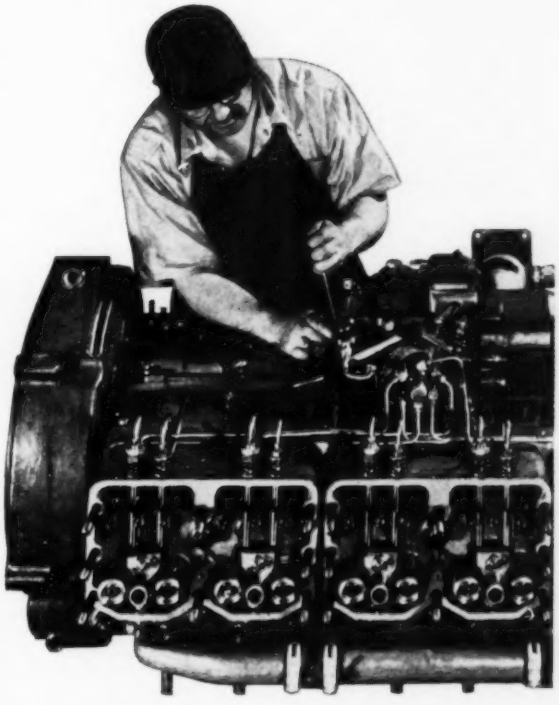

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15th National Industrial Sand Assn. Convention Draws Excellent Attendance

By
WALTER E. TRAUFFER

smothers ON THE SPOT report

THE fifteenth annual convention of the National Industrial Sand Association, held at The Homestead, Hot Springs, Va., May 17-19, 1950, was one of the best attended meetings ever held by this group. The sessions were packed with vital and interesting information on many subjects and the weather was excellent for those interested in golf or other outdoor sports after the meetings.

New Officers The last item of the convention was the election of new officers and directors. Sterling N. Farmer (vice-president of the Sand Products Corporation, Cleveland, O.) is the new president; elected treasurer was C. M. Hardy (Hougland & Hardy, Evansville, Ind.); C. R. Wolfe, (National Pulverizing Company, Millville, N. J.) is the new treasurer. The three new directors are Russell Cronenweth (Great Lakes Foundry Sand Company, Detroit, Mich.); Lyle T. Manley (Manley Sand Company, Rockton, Ill.); Jesse T. Morie (Jesse S. Morie & Son, Mauricetown, N. J.).

Sterling N. Farmer (Sand Products Corp., Cleveland, O.), newly-elected president of N.I.S.A.

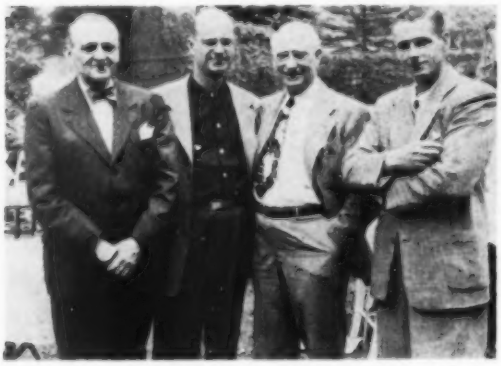
Legal Developments Theodore C. Waters, association counsel, in his annual report gave particular attention to developments with respect to silicosis. He mentioned a number of important meetings held in recent months which had to do with public and industrial health. At most of these, he said, the medical aspects received much more attention than did engineering control. There is growing concern over the hazards to workers, and efforts are being made in some quarters to eliminate the use of silica sand for some purposes and to substitute other materials. As yet, said Mr. Waters, no satisfactory method has been found to evaluate disability due to respiratory diseases.

Mr. Waters said that feeling in all quarters is growing against both stream and air pollution, especially since the Donora tragedy. He predicted that legislative measures will soon be taken to prevent all such pollution and that producers would be wise to eliminate such contamination from their operations.

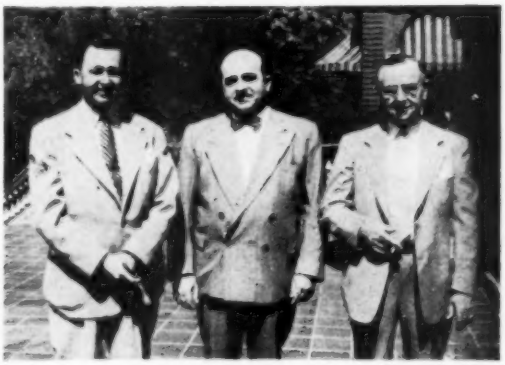
According to Mr. Waters, there were no startling developments on employees compensation during the year, as few state legislatures met. In 1951, he said, most legislatures will meet, and much may be done along these lines, especially with the unions putting on pressure. He advised producers to follow these developments closely. The model code of industrial hygiene which Mr. Waters described at the last meeting has met with official approval and is being used as a guide by several states in formulating their codes. The New York State code has long been regarded as a model and this, said Mr. Waters, may soon be revised.

In closing Mr. Waters said that silicosis insurance rates in the industry went down 15 percent in 1949 and will receive a similar decrease in 1950. Favorable experience will further reduce rates. The speaker urged that the association and individual members continue unabated their efforts to reduce hazards. People want and are entitled to clean places in which to work, clean air, and clean water.

Engineering Report Stanton Walker, engineering director of the association in his annual report told of the progress that had been made in getting cleaner cars for the shipment of industrial sand and also in determining which types of impurities were the most damaging. Samples of each of the worst impurities,



Vincent P. Ahearn (N.I.S.A.), Emory M. Durstine (Keener Sand & Clay Co., Columbus, O.), G. W. Cannon and G. W. Cannon Jr. (Nugent Sand Co., Muskegon, Mich.).



Gene Mason (Concrete Materials Co., Waterloo, Ia.), R. S. Lebold (Michigan Silica Co., Rockwood, Mich.), and F. B. Clarke (Whitehead Brothers Co. New York, N. Y.).

ranging from vermiculite to grain, were sent to members so that they could be recognized and proper precautions could be taken. In New Jersey, he said, producers are rejecting dangerously contaminated cars in spite of the car shortage there.

The possible use of ground sand as an admixture in concrete, according to Mr. Walker, does not hold much promise; but tests have shown that ground glass is very effective. He also described the progress that has been made with respect to the development of bag packers able to take the excessive wear caused by silica sand.

Executive Secretary In his report to the meeting Vincent P. Ahearn, executive secretary, discussed the quarterly car supply reports which members are requested to send in. In one area, he said, producers held a conference with railroad officials as a result of which producers every Friday report the number and types of cars needed in the coming week. This cooperation resulted in a great improvement in the car supply in that area. Mr. Ahearn stated that the increase in business will create another shortage of cars, especially gondolas and box cars. He suggested that producers help the situation by asking customers to equip themselves to receive sand in hopper-bottom cars. He closed by saying that railroads must be kept aware of the fact that the industrial sand industry is a basic one on which many others depend and that the association's report helps in this respect.

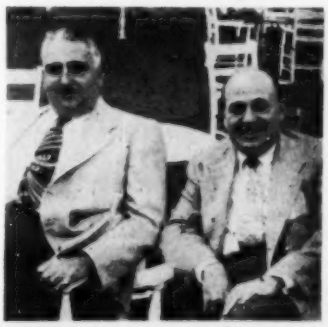
Insurance Workmen's Compensation insurance from the standpoint of the insurance company was discussed by Fred W. Braun, Employers Mutual Insurance Co., Wausau, Wis. He described the problems faced by the insurance companies during the depression, when so many claims were filed that some companies cancelled policies in industries in which silicosis was a possibility. His company hired an industrial hygienist, built a laboratory, and after years of research proved that many men having a slight touch of silicosis can work indefinitely if given good protection, clean surroundings, etc. Silicosis is no longer considered a serious problem. The speaker quoted figures which showed that in Wisconsin the percentage of compensation payments charged to occupational diseases, and particularly to silicosis, have decreased considerably. As a result the insurance rates have also decreased. In spite of greatly liberalized benefits, the rates are now actually lower than they were in past years, and the same is true in other parts of the country.

In closing Mr. Braun urged that the industrial sand industry continue to attack the silicosis problem from all angles. The industry can help by maintaining clean and well ventilated plants, by insisting that exposed employees wear masks, and by keeping employed old or partly disabled workers.

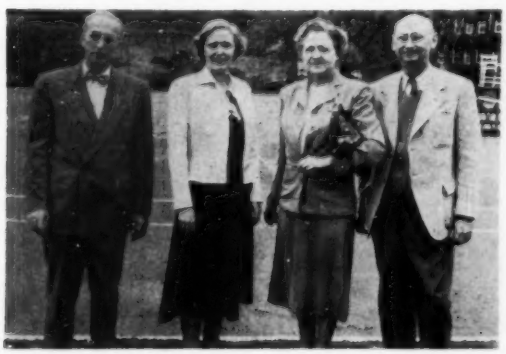
The Washington Scene As always, one of the highlights of the convention was the review of the Washington scene by Vincent P. Ahearn, executive secretary of the association. Mr. Ahearn declared that American businessmen are often unwitting supporters of socialism, and that they must stop asking for subsidies. Business, he said, has asked for many of the existing controls, being largely responsible for the Robinson-Patman Act, the Wage and Hour Law, and others. The Hoover Commission Report, said Mr. Ahearn, was enthusiastically received by business, but when it came to cutting down expenditures in governmental departments affecting their own businesses, they sabotaged the plan.

Mr. Ahearn outlined the expenditures planned for the coming year and the expected deficits which may mean increases in taxes next year. The feeling against deficit spending is growing, he said; and much can be gained if businessmen will tell Congress the truth about business and what some of the more radical measures before it will do to

Fred W. Braun (Employers Mutual Insurance Co.) and Stanton Walker (N.I.S.A.).



Arnold H. Tenzer and Arthur B. Schlesinger (New Jersey Pulverizing Co., New York, N. Y.).



Mr. and Mrs. Sterling N. Farmer and Mr. and Mrs. Henry C. Thornton (Ottawa Silica Co., Ottawa, Ill.).

Left: Mr. and Mrs. E. C. Sawyer; right: Mr. and Mrs. Charles A. Gorsuch (all of Ayers Mineral Co., Zanesville, O.).

Above: L. T. Manley (Manley Sand Co., Rockton, Ill.), Russell Cronenweth (Great Lakes Foundry Sand Co., Detroit, Mich.), and Jesse T. Morie (Jesse S. Morie & Son, Mauricetown, N. J.).

Left: Mr. and Mrs. Norman H. Crissey (Wedron Silica Co., Chicago, Ill.).

Right: This is not typical, but one industrial sand producer did get a car like this.

our economy. Compulsory arbitration of labor disputes is, he said, another step toward national socialism. According to Mr. Ahearn, it is better to have strikes. A free society is an insecure society; the only ones with security are life prisoners. In closing, Mr. Ahearn emphasized the importance of the National Security Resources Board, especially in case of another war.

Business and the Welfare State

Business and the Welfare State was the subject of a very enlightening talk by George C. Smith, economist, Chamber of Commerce of the United States, and the author of the book *Socialism in America*, recently published by the Chamber. Mr. Smith said that in this country we are very definitely headed for socialism by the back door. He pointed out that the Democratic platform in 1948 was substantially the same as that of the Socialist Party. We are letting our leaders in Washington create a climate in which private enterprise cannot exist and are surrendering one after another of our rights as free citizens. The Washington ideology is one of controllism—the desire to control everything—and yet these ideologists resent being called Socialists. After the war was over, said Mr. Smith, the President wanted full controls over price, production, etc., in order to combat inflation. Early in 1949 he asked for similar powers after the peak of the price climb had been passed, as well as federal authority to build plants to compete with private industry.

The welfare state, Mr. Smith stated, is nothing new; it goes back to the 1600's in Germany, when the welfare state and the police state were synonymous. Bismarck was one of the first exponents, and Czar Nicholas of Russia sponsored socialized medicine, as do Stalin, Peron, etc., finding such measures and controls a good way to remain in power. Federal aid is another step toward socialism. Businessmen were warned not to ask the government to do anything that they can do for themselves. Almost every Communist government has succeeded a weak socialist government, and England is in danger of taking that step. Mr. Smith declared that we must convince labor unions that they gain nothing from socialism, as they would lose their present power; we must show them that working conditions are always worse in government-operated industries.

Credit Information

One member described a program for handling delinquent accounts worked out by producers in his state. This program, which has worked very satisfactorily, provides credit information to each cooperating producer for his own use only. No group actions are taken. Special forms were developed on which monthly reports are made to a central body, which pools the information and publishes a list of delinquent accounts with the amount and the number of months past due but without giving the names of the producers involved. The reports made it clear that certain customers were playing one producer against another and delaying payments on old accounts while buying current needs from other producers and paying those bills on time. Producers have found this credit system more helpful than any outside credit ratings. The information is also found helpful in indicating the state of business generally.

Washington News Letter

(*From page 74*)

Meanwhile anti-trust action is also going forward on the Congressional front. The so-called anti-merger bill has passed the House and is now before the Senate. This bill seeks to plug up one of the biggest loopholes in present anti-trust legislation. Despite all our anti-trust laws, at present there is nothing illegal about creating a monopoly if it is done by one company buying the assets of another company. Such monopolies are not reached by the law.

This proposed legislation would give the Federal Trade Commission the power to prevent such mergers if they would tend to create monopoly or reduce competition. If passed, this will require a special kind of clairvoyance on the part of the Federal Trade Commission. It has been hard enough to prove that monopoly actually exists. It will be very much harder to defend the position that a proposed merger will lead to monopoly some time in the future.

A.S.M.E. to Sponsor Show of Power, Mechanical Engineering

Dates for the 19th National Exposition of Power and Mechanical Engineering are November 27 to December 2. It will be held in Grand Central Palace, New York under the auspices of the American Society of Mechanical Engineers, in conjunction with the society's annual meeting at that time.

Since the inception of this exposition in 1922 A. S. M. E. has actively co-operated, maintaining an interesting and informative exhibit each year. The 1950 exposition, however, is the first to be held under the auspices of the A. S. M. E.

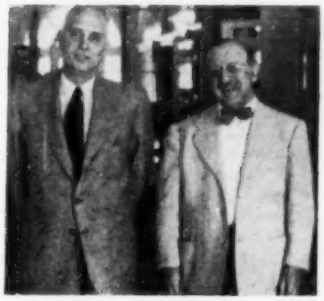
N. L. A. Convention Speakers Point to New Lime Outlets, Discuss National Issues

By WALTER E. TRAUFFER

another ON THE SPOT report

THE 48th Annual Convention of the National Lime Association, held May 11-13, 1950, at The Homestead, Hot Springs, Va., was one of the most successful yet held, both from the standpoint of attendance and the number and caliber of the speakers. In spite of the railroad strike, which delayed some of the arrivals and kept some members from attending, the total registration was 120, with 44 ladies present, a new record for the latter. The speakers, from the United States, England, and South Africa, covered a wide range of subjects of interest to the industry. Indicative of the progressive attitude of the association is the fact that new and expanded outlets for lime received most of the attention, as they have for the last several years. The entire program, including the entertainment, was well planned, the only drawback being the rainy weather which limited the amount of golf and other outdoor sports indulged in after the meetings.

General Manager's Report According to Robert S. Boynton, general manager, the National Lime Assn. added several new members during the last year, and the association membership now represents over 70 percent of the capacity of the industry, the highest since NRA days. He was justly proud of the fact that the growth of the association has been partly responsible for the fact that the dues structure has not been changed during the inflation. In spite of this the association is in excellent financial condition and has increased its budget to provide for more research.



• Wallace E. Wing and Irving Crown (Marblehead Lime Co., Chicago, Ill.).

Mr. Boynton also commented briefly on many other matters of importance to the industry and the association. He told of the progress on percentage depletion (which has since been approved for the lime industry by the House Ways and Means Committee). In discussing the research program, he pointed out the growing importance of trade waste treatment and soil stabilization as outlets for lime. The agricultural research program at five universities is being completed, and the resulting book should be an important one.

The meeting of the Operating Division at Toledo last Fall, said Mr. Boynton, was a very successful one, but the one to be held in Bellefonte, Pa., about September 8 and 9 will be even better. This will actually be at the Nittany Lion Inn, State College, Pa., and will include a one-day plant inspection trip. The directors' meeting, he said, will again be held at Ponte Vedra, Fla., late in October. The 1951 annual convention of the association will be at The Homestead, Hot Springs, Va., May 10-12, 1951.

• Left: T. L. Webb, South African Council for Scientific and Industrial Research, and Dr. N. V. S. Knibbs, lime expert from England.

• Right: Burton Ford (St. Regis Sales Corp.) and K. L. Hammond (Keystone Lime Works, Inc., Keystone, Ala.). Mr. Hammond celebrated his birthday on May 12.

Safety Contest Kent Jander, who last year joined the Association's staff, announced the winners of the 1949 N.L.A. Safety Competition. These are presented in detail in the news pages of this issue. Among the 46 plants entered in the contest there were no fatalities, no permanent total disabilities, and only one permanent partial disability, an excellent record considering the 6,500,000 man-hours worked. Nine of the 16 plants which had no lost-time injuries were operated by member companies and were awarded framed certificates.

South Africa An honored guest and speaker from a foreign country was T. L. Webb, South African Council for Scientific and Industrial Research, Union of South Africa, which he described as an institution similar to our Bureau of Standards, supported jointly by government and industry. His subject was *South African Research on Building Lime*. He began by giving a few statistics which showed that lime ranks high among the products of that country. The limestone deposits, he said, are in Pretoria and are a blue-gray dolomite of high magnesium content. These deposits are within an area 90 miles in diameter, and all of the 18 producing plants are located there. Together they have a capacity of 350 tons daily. Mixed-feed kilns fired with low-grade coal are used, and hydrating is done on the floor.

The lime formerly produced was satisfactory for some purposes, said Mr. Webb, but when used in plaster and mortar, it popped, scaled, and cracked. It was to correct these deficiencies in the lime that research was initiated in 1946. The trouble, stated the speaker, is probably due to the wide variation in the quality and characteristics of the limestone used, plus lack of control in combustion, resulting in the presence of

unhydrated magnesia. A wide range of tests has been made, especially in methods and periods of calcination. The results of these tests are expected to help determine the trouble.

Pension Plans One of the most timely of the many important subjects discussed at this meeting was *Pensions and Pension Planning* by Henry M. Beatty, pension consultant of Cleveland, O. Mr. Beatty was well known to most of those present and was well qualified to speak on this subject as it affects the lime industry in particular, having been connected for many years in important capacities with one of the large member companies. He had also been active in the affairs of the association, in which he also held several important positions.

Mr. Beatty began by stating that actual operating costs need not necessarily increase because a pension plan is installed. Workers today are very much interested in security, and a pension plan instills a feeling of security which improves the morale and the efficiency of the entire working force. Experience has also shown, said Mr. Beatty, that a pension plan reduces labor turnover, and this lowers the cost of production. A third saving is in the fact that men past the age of efficiency, especially those doing manual tasks, can be retired on pensions instead of being kept on in nonessential positions.

The three major types of pension plans now extant—trusteed, insured, or a combination of the two—were then described. The insured plan is purchased from an insurance company and is available in the following types: group annuity, deposit administration (either standard or collective bargaining), individual policy, and group permanent. The trust fund type of pension plan is handled through a bank or trust company. It is available in the following types: fixed fund or commitment (either past service or future service), the pay-as-you-go type, extended funding, and the profit-sharing trust type.

Mr. Beatty went on to tell how the ultimate retiring benefits may be established on either of two general bases: benefits including Social Security; and benefits exclusive of Social Security. He also described the many variations of vested rights, death benefits, etc., and made cost comparisons of the best known plans now in force in some of our leading companies. Mr. Beatty also stressed the importance of deciding whether the age limit of a plan is to be 65, 68, or 70 years, as the lower age limits mean a shorter period to provide a retirement fund and more

• Mr. and Mrs. E. L. Williams (Riverton Lime & Stone Co., Riverton, Va.).

• Members of the association's staff: Gladys L. McBee, Betty L. Reger, and Kent Jander.

• The speakers' table: Hayes H. Black (U. S. Public Health Service), Dr. Willem Rudolfs (Rutgers University), Dr. L. John Minnick (G. & W. H. Corson, Inc., Plymouth Meeting, Pa.), and W. A. Parsons (Rutgers University).

• Mr. and Mrs. W. F. King (National Mortar & Supply Co., Pittsburgh, Pa.).

years of retirement to be paid for.

Mr. Beatty took issue with the general feeling that a worker will be more conscious of a benefit to which he is contributing, as any contribution he makes is deducted before he gets his pay check. The worker also is inclined to regard such a deduction as a reduction in his take-home pay, rather than as a savings deposit. In closing, Mr. Beatty described the functions of a pension consultant who (1) suggests a plan tailored to suit the average age and profit experience of a company; (2) determines the cost, actuarily, of the specific plan; (3) assists in the negotiation and possibly the installation of a pension plan. An actuary then estimates the cost of the plan, taking into consideration the size of the group, withdrawal experience, compensation of each employee, mortality table, and anticipated interest to be earned by trust. He advised that, if possible, a pension plan should not be set up in which ultimate benefits cannot be determined; he stated that vesting should be omitted, and that death benefits should be handled under group life insurance rather than under a pension plan. If a trusteed plan is installed, Mr. Beatty added, the company should retain management of the trust.

Industrial Pollution *Correction of Industrial Waste Pollution* was the subject discussed by Hayes H. Black, Chief, Industrial Wastes Section, Survey and Investigation Branch, U. S. Public Health Service. He opened with the cheerful statement that the growing attention being paid to the abatement of industrial pollution will mean more demand for lime, but he warned that specifications will become more rigid. Just before the war, said Mr. Black, the public was becoming aware of the need for abatement of pollution, and the drive to this end is again well under way. There is now a federal anti-water pollution law, and a number of states have taken similar measures and more will follow suit. He estimated that about 3 billion dollars will be spent by industry in the next decade to control air and water pollution. Mr. Black then described the manner in which the Public Health Service is working with states, industries, etc., and told of the 11 major drainage areas which are now being investigated to determine the corrective measures needed.

Industry as a whole, said Mr. Black, is in favor of pollution control. Many industrialists are unable to get suitable process water under existing conditions. Some industries, he said, can recover salable byproducts in treating their wastes; some can change their processes or even their raw materials in order to reduce the amount of waste created; and some can fit in with municipal treatment facilities. According to Mr. Black the art and science of industrial waste treatment must keep up with and be a part of industrial development, and lime will continue to play an important role. In closing, the speaker showed a series of colored slides which illustrated with shocking clarity what can happen to a clear stream of water after it passes through an industrial area.

Agricultural Research A report on the progress of the National Lime Association's agricultural research program was presented by Dr. Firman E. Bear, chairman of the Soils Department, New Jersey Agricultural Experiment Station. He said that the July, 1951, edition of Soil Science will contain full information on all research results to date in the five states cooperating with the association through their agricultural experiment stations. He also described a bulletin with 100 questions and answers on the liming of soils. Dr. Bear mentioned that tests with radioactive calcium have indicated that it may be helpful to plants. Molybdenum has also been found helpful. One pound of sodium molybdate per acre increased the yield of alfalfa 12 percent. Lime makes the molybdenum available. Dr. Bear suggested that it might pay to add 1 oz. of molybdic oxide to each ton of lime.

• Henry A. Strain (Carnegie-Illinois Steel Corp.), who spoke on the use of lime and limestone in the steel industry.

Lime and Steel Under the heading *Lime and Limestone in the Steel Industry*, Harry A. Strain, director of raw material, fuel and power, Carnegie-Illinois Steel Corporation, told an interesting story of the depletion of our high-grade ore reserves, the development of foreign deposits available to us, and the methods being perfected to utilize our vast resources of low-grade ores. Our present reserves readily available will last over 100 years at the present rate of use and there are vast reserves which can be beneficiated by methods already being perfected. Eventually, said Mr. Strain, this will cause a tightening of physical and chemical specifications for lime, limestone, and other materials used in steel manufacture, and a variety of steels will be produced which are suitable for limited uses. There will be a trend, he stated, from raw calcite to raw dolomite, and from single- to double-burned roasted dolomite.

Trade Waste Research In his *Report on Sewage and Trade Waste Research at Rutgers University*, Dr. Willem Rudolfs, chairman of the Department of Sanitation at Rutgers, presented some very interesting figures. He said that the domestic wastes of 90 million people enter our sewer systems, and those of about 65 million receive some kind of treatment. The organic wastes of the paper and pulp industry alone equal those of 43 million people, and those of industry as a whole total 119 million. The inorganic wastes of industry bring the total of wastes entering our waters to over 12 million tons annually.

The lime industry, Dr. Rudolfs declared, has a big stake in the treatment of wastes. It is simple to work up general information on the subject but for the best interests of the industry the association should work out details for the neutralization problems of all industries. Some types of lime, the speaker stated, are best for certain purposes and much must be learned about them. We must know which lime will do the job most economically and efficiently, which creates the least sludge, which speeds up the process, which creates sludge most easily disposable, etc.

• The photographer had his picture taken. Michael Brisch (Rockwell Lime Co., Chicago, Ill.), flanked by Burton A. Ford (left) and John F. Gruber, both of the St. Regis Sales Corp.

• Mr. and Mrs. William A. Wilson (Pit and Quarry) were in attendance, as usual.

Dr. Rudolfs then described in detail the work being done under his direction and the many ramifications involved. It has been learned that no matter what type of lime is used or how it is added, some precipitation occurs in varying degrees.

Lime Stabilization A report on lime stabilization research at Purdue University was given by K. B. Woods, professor of highway engineering at that institution. He described a series of freezing and thawing tests made on various types of soils with lime alone and in combination with other additives, including emulsions, tars, and Vinsol resin. The conclusions reached indicated that lime alone does not help fine-grained soil materially but that lime with a small percentage of bitumen is very effective. With semi-granular soils it was found that 5 percent of lime alone is almost as effective as if some other additive is included. He said that it is safe to use lime alone for soil stabilization where there is little freezing and thawing, and that the durability date so far accumulated justifies making field tests in some of the colder states with additives to reduce absorption.

Fundamental Studies Professor James A. Murray, associate professor of materials, Massachusetts Institute of Technology, was present to give his annual report on the fundamental study of lime being carried on there under an N.L.A. fellowship. He first mentioned the report he made at the preceding meeting on the burning of calcite in a small laboratory kiln and stated that complete result data will soon be published. The time required to reach the calcining temperature of 1,700 deg. F., he stated, controls the characteristics of the lime, and the amount of exposure thereafter has little effect. There are many questions for which answers are yet to be found, and limestones may react very differently.

Tests are also being made of finishing plasters on the wall, Dr. Murray reported, and some conclusive results are expected by the first of next year. Some very peculiar results were also obtained in the calcination of high-calcium commercial limestones. Results already in, he indicated, cause him to disagree with one well-known lime authority who says that the magnesium carbonate in dolomite always begins to dissociate below 1,000 deg. F.

Lime and Insecticides *Lime and the Newer Insecticides* was the subject discussed by Dr. E. E. Fleck, chemist, bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. The use of lime, he said, dates back to early history, but its use in insecticides began about 1860, when the original Bordeaux mixture was developed. This is still widely used, and lime is still an important ingredient. Dr. Fleck reviewed the drastic changes that have occurred in the types and uses of insecticides in recent years, mentioning and describing D.D.T. and others with much longer names but less well known. Some of these, he said, work best with lime, while others are incompatible for various reasons. There is much study of this subject now going on. Dr. Fleck expressed his conviction that lime will continue to be important in the insecticide field, but that its use will be limited to certain types.

Threat of Socialism The featured speaker at one of the meetings was Arch N. Booth, general manager of the U. S. Chamber of Commerce. His discussion of *Truth in Action* was one of the best analyses of national trends that it has ever been our pleasure to hear. He interspersed his serious statements with items of humor which helped to drive home the points he was making. He declared that, whether we know it or not, we are drifting gradually toward Socialism, and that we must start to do something about it at once. Socialism is, he said, government ownership and control of the means of production and distribution of goods, resulting in the complete loss of personal freedom and the incentive to better one's position in life. He gave Great Britain as an example. The Briton is much more restricted than we are and is allowed to do and have practically none of the things that we take for granted. The type of government there takes so much of the worker's salary that he cannot buy the things he should have or lay away anything for the future; the government, therefore, must take care of him in emergencies.

If we don't wake up, Mr. Booth warned, we will find ourselves in the same predicament. We are being fed Socialism gradually. An excellent comparison was used to illustrate this point. If a frog is placed in water which is then heated quickly, he will jump out. If, however, the water is heated gradually, Mr. Booth pointed out, he will be soothed; he will doze off, stay in the water and get cooked.

Our way of life, free enterprise, the speaker declared, has given us more than any other nation in all history, and the world knows this. The

(Continued on page 170)

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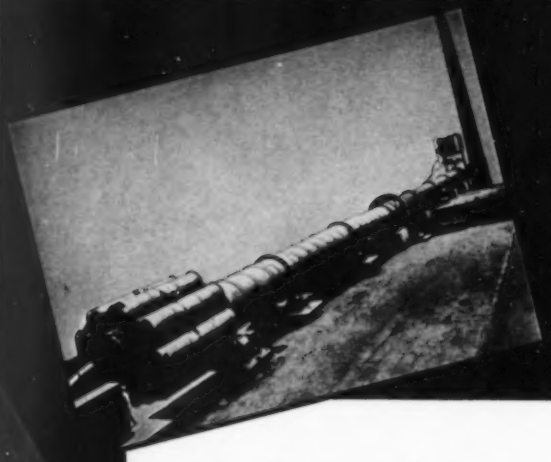

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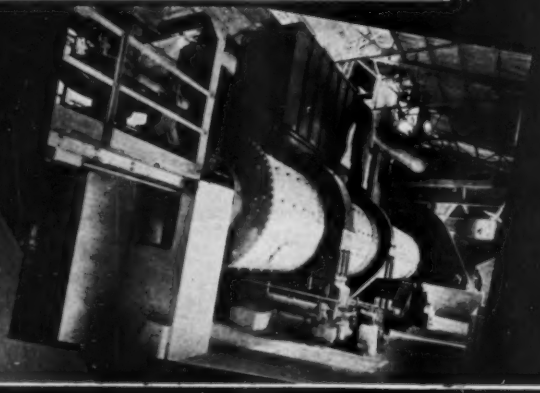

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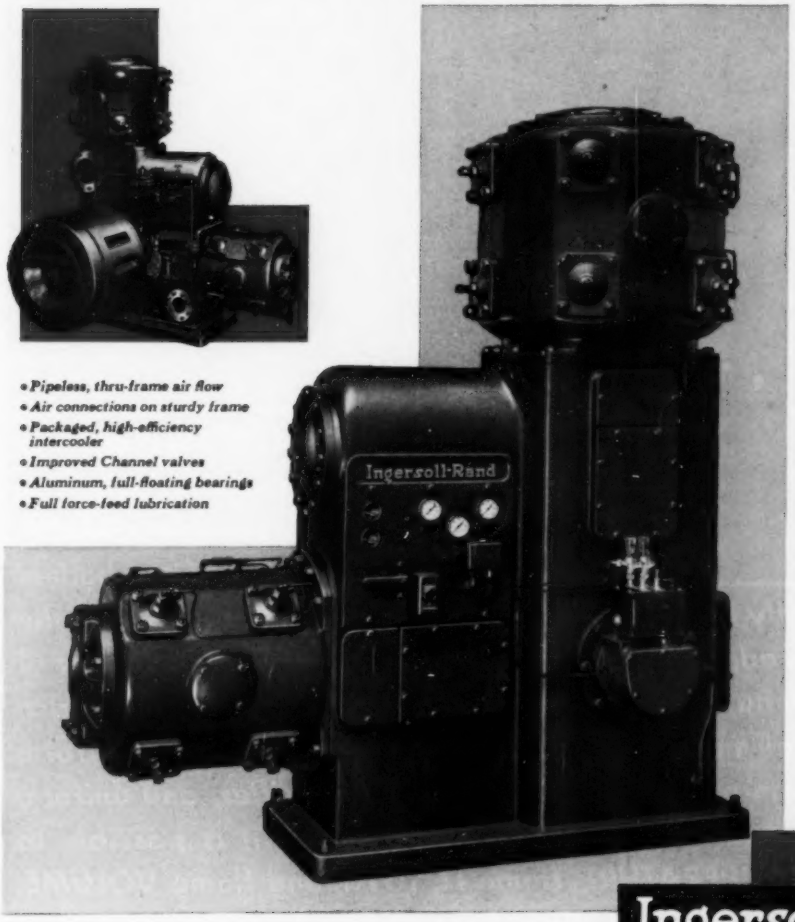

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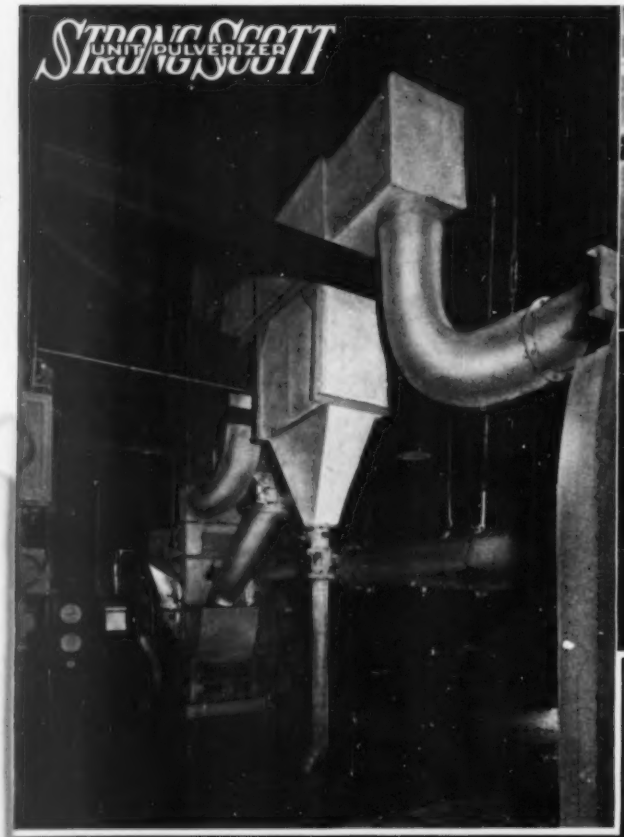

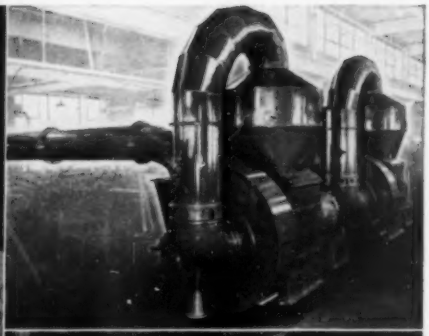

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Effect of Gypsum Content on Compressive Strength of Cements

By JOHS RUTLE
Chief Chemist Christiania Portland Cementfabrik, Slemmestad, Norway

THIS paper presents an abstract of more extensive investigations carried out in order to examine the ability of various standard test mortar methods to indicate the comprehensive strength of cements in concrete mixes.

Included in these investigations were also several cements prepared of the same clinker, but varying in quality in respect to gypsum content and fineness.

Because of rather interesting results obtained with these cements, insofar as compressive strength in concrete mixes is concerned, a description covering this part of our investigations will be given here.

Preparation of the Cements

Several tons of cement clinker from a rotary kiln were unloaded on a concrete floor. The clinker was divided into several heaps and left stored on the floor for some days.

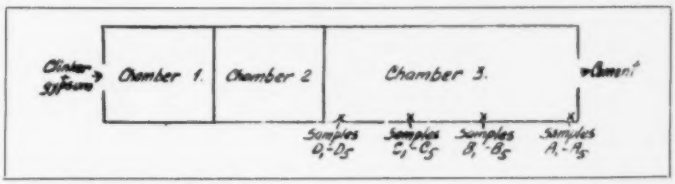
The clinker was then ground in a finishing mill, the mill being fed with equal portions from each clinker heap. These measures enable a feed of uniform quality during the whole grinding operation. The grinding operation was divided into five periods, each lasting one hour.

The amount of gypsum added to the clinker was as follows: 1st period —1.5 percent, 2nd period—2.5 percent, 3rd period—3.5 percent, 4th period—4.5 percent, 5th period—5.5 percent.

After each period the mill was stopped and samples drawn inside the mill as indicated in the sketch at the right above.

Altogether 25 samples were taken. The designation and fineness as well as gypsum content of the cements are given in the following table:

	Gypsum %	Surface area cm²/g
Cement A_1	1.5	2460
" A_2	2.5	2340
" A_3	3.5	2390
" A_4	4.5	2310
" A_5	5.5	2500
Cement B_1	1.5	2010
" B_2	2.5	1990
" B_3	3.5	2110
" B_4	4.5	2130
" B_5	5.5	2090
Cement C_1	1.5	1710
" C_2	2.5	1650
" C_3	3.5	1750
" C_4	4.5	1700
" C_5	5.5	1690
Cement D_1	1.5	1420
" D_2	2.5	1400
" D_3	3.5	1380
" D_4	4.5	1450
" D_5	5.5	1320



Chemical Composition of Cements

The chemical analysis of the cements showed that they were very nearly uniform as to their chemical composition, except for the gypsum content. The chemical disparities were so small that they might be attributed to analytical errors.

The average chemical composition of the clinker, derived from the cement analysis, was as follows:

Insoluble residue	0.1 percent
SiO_2	19.7 percent
Al_2O_3	7.3 percent
Fe_2O_3	3.2 percent
CaO	62.8 percent
MgO	3.4 percent
SO_3	1.5 percent
Alkalis and loss	2.0 percent
Total	100.0 percent
Free CaO	1.0 percent
Compounds (Bogue)	
C_3S	52.0 percent
C_2S	18.0 percent
C_3A	13.9 percent
C_4AF	9.7 percent

Compressive Strength of Cements

The cements were tested on compressive strength in three concrete mixes proportioned by weight as follows:

Mix I—1 cement; 2 fine aggregates; 3 coarse aggregates. W/C-ratio = 0.48. Cement factor = 375 kg. cement per m³ concrete.

Mix II—1 cement; 3.5 fine aggregates; 3.5 coarse aggregates. W/C-ratio = 0.61. Cement factor = 275 kg. cement per m³ concrete.

Mix III—1 cement; 6 fine aggregates; 5 coarse aggregates. W/C-ratio = 1.05. Cement factor = 175 kg. cement per m³ concrete.

Consistency of the mixes: plastic slump = 10—12 cm. Size and curing of specimens: 10 cm. cubes, 24 hours in air of high humidity, then submerged in water until they break.

Aggregates termed as fine aggregates passed a 4.7-mm. sieve. Aggregates termed as coarse aggregates were retained on a 4.7-mm. sieve and passed a 25-mm. sieve.

The test results are given in the accompanying figures. Figures 1 and 2 show respectively 7 days' and 28 days' compressive strength plotted against the gypsum content.

It will be noted that for Mix I (W/C-ratio =

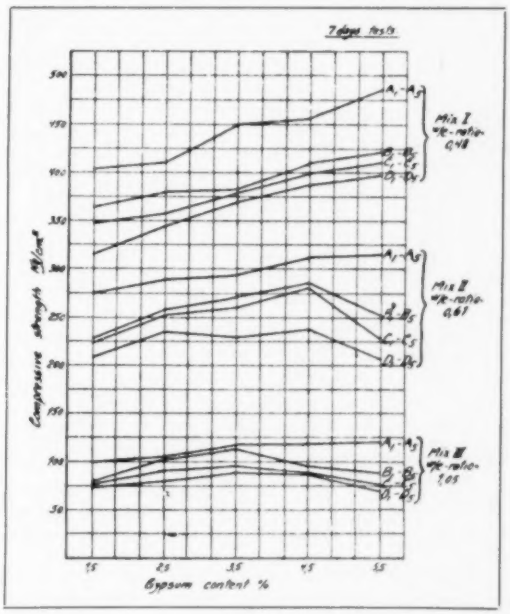


Figure 1.

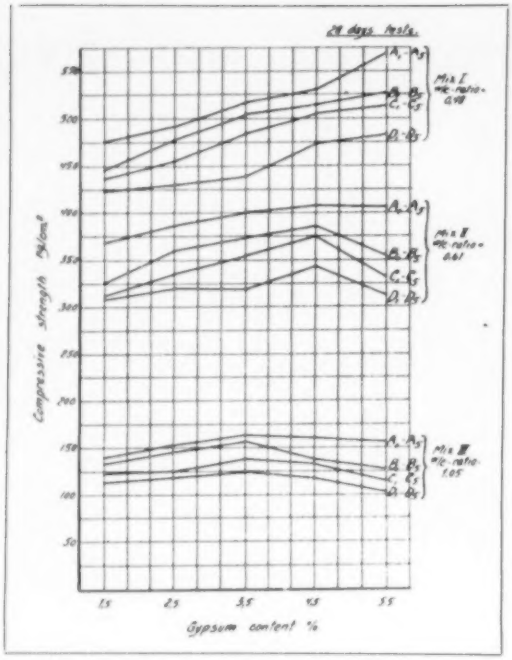
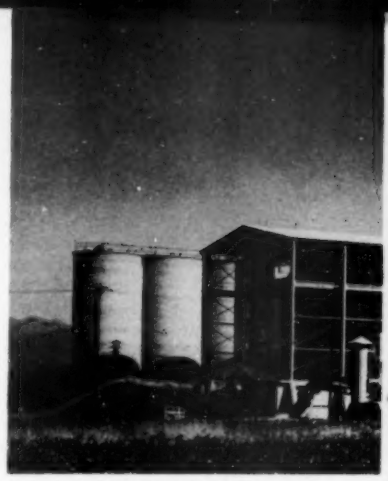


Figure 2.

lowest to the highest gypsum content. For Mix II (W/C-ratio = 0.61) and Mix III (W/C-ratio = 1.05) the compressive strength increases with gypsum content until a maximum strength value is reached; further rise in gypsum content causes compressive strength to drop gradually. The critical gypsum content above which the drop in strength commences is around 4.5 percent for Mix II and around 3.5 percent for Mix III.

The drop in compressive strength when gypsum content runs too high is less marked for the finely ground cements (group A_1-A_5) than for the cements of moderate fineness.



0.48) the compressive strength increases with gypsum content within the whole range from the

The curves in Figures 3 and 4 show the compressive strength plotted against the W/C-ratio.

The results recorded by these curves are average test results for groups of cements. All cements with the same gypsum content belong to one group.

It will be noted that the drop in compressive strength with increasing W/C-ratio is markedly affected by the gypsum content of the cements.

The effect of gypsum content on compressive strength of cements pre-

(Continued on page 97)

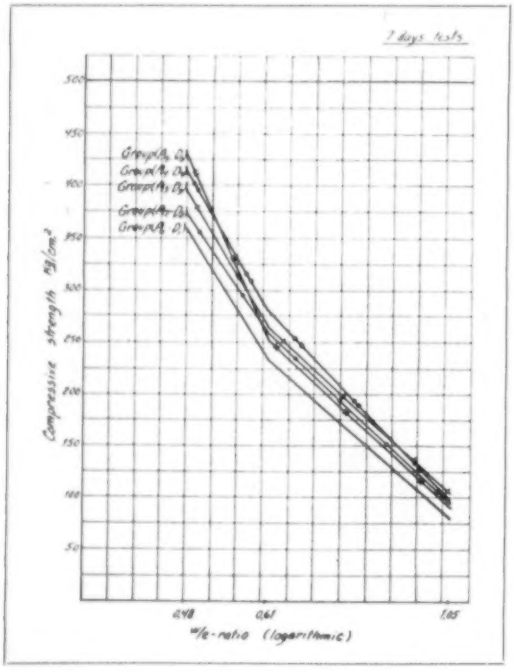


Figure 3.

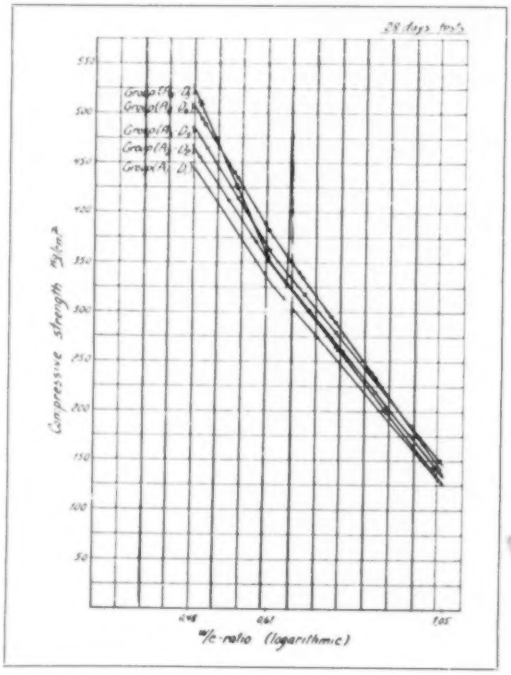
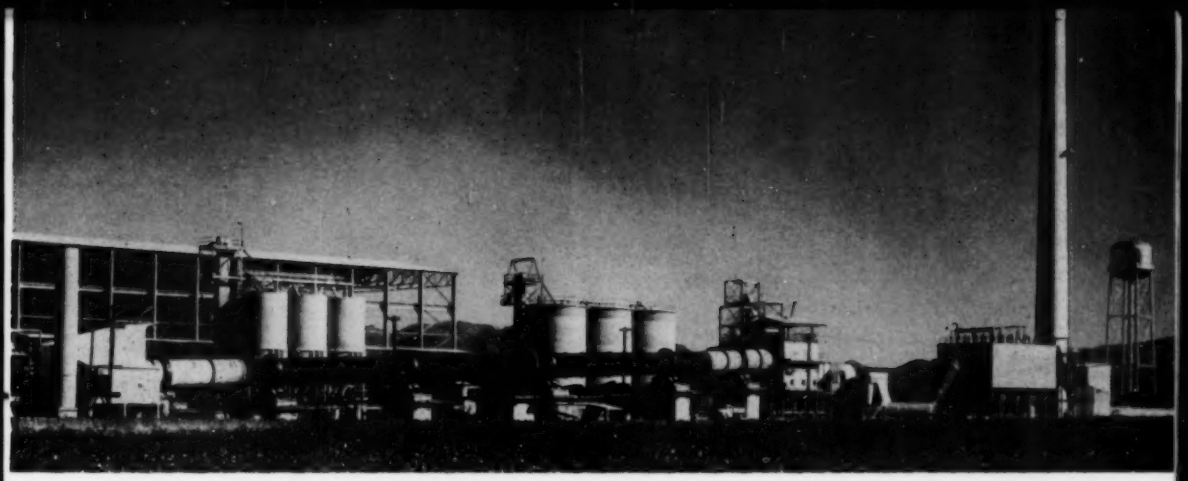


Figure 4.



New dry-process plant of the Arizona Portland Cement Co., located at Rillito, Ariz., near Tucson. The first large-scale commercial operation in the state, the plant attained full production of 2,000 bbls. per day early this year.

ARIZONA'S OWN PORTLAND CEMENT PLANT

another ON THE SPOT report

FULL production was attained early this year at the new plant of the Arizona Portland Cement Company. The plant, located at Rillito, Ariz., near Tucson, is completely modern in every respect, a highly-efficient dry-process operation with a daily capacity of 2,000 bbls.

General contract for the erection of the plant, for which ground was broken late in November, 1948, was in the capable hands of the Fisher Contracting Co. of Phoenix. R. G. Patterson was project manager during construction. Scarcely a year later the various operating units were integrated and partial production began.

The plant is located on a 100-acre site owned by the company, the quarry where both limestone and shale are obtained being located about 5 miles distant. After blasting, the raw material is transported by motor truck to the primary crusher at the plant. Iron ore and gypsum arrive by rail over the Southern Pacific.

Features of the new plant include the use of closed circuit grinding with air separation on both raw and finish ends, and a single rotary kiln 9½ ft. in diameter and 335 ft. long. Provision has been made in the layout for adding a second and third kiln paralleling the present burning unit if and when the demand warrants. Clinker capacity is 2,000 bbls. per day, and the kiln is fired with natural gas. Temperature of the clinker is reduced and the heat is recuperated by an air-quenching, inclined-grate cooler. Dust collection equipment on the kiln consists of the latest type of Multiclone and Cottrell electrical precipitators exhausting up a 225-ft. kiln stack. The reinforced-concrete stack was erected under separate contract by the Rust Engineering Company.

Storage capacity of finished cement is already being doubled, three additional silos now being under construction. Currently the plant is producing cements meeting Type I, Type II, and low-alkali specifications. Shipments are about equally divided between bulk and sacked product. The brand name "Arizona" is superimposed on the bags over a background depicting a typical Arizona theme predominated by the saguaro (giant) cactus.

Power for plant operation is generated in the company's own plant on the premises, the diesel-driven alternators being rated at 3,000 kilowatts.

With the completion of the Rillito plant, the state of Arizona is for the first time largely independent of out-of-state sources for its construction requirements. Although it is the first large-scale commercial operation of its kind to operate within its borders, it is not Arizona's first cement plant. Thirty-five or 40 years ago a small plant was erected and operated to supply the cement requirements in the construction of Roosevelt Dam. The plant was later dismantled.

The Arizona Portland Cement Co. is a wholly-owned subsidiary of the California Portland Cement Company of Los Angeles. E. E. Duque is president of both companies.

Booklet on Air Power Offered To Engineers and Operators

A new 18-page booklet entitled *Compressed Air Power*, containing extensive basic reference data on compressed air and gas power, has been made available at no cost by the Compressed Air and Gas Institute.

Designed as a general non-technical review of the application of compressed air and gas theory to actual machines and uses, this booklet will be of value to all branches of engineering. It gives the basic principles of the utilization of air power.

The booklet may be obtained by applying to the secretary, Committee on Engineering Education, Compressed Air and Gas Institute, 1410 Terminal Tower, Cleveland 13, O.

Montreal Plant Typifies Growth Of Canadian Cement Industry

By

WALTER E. TRAUFFER

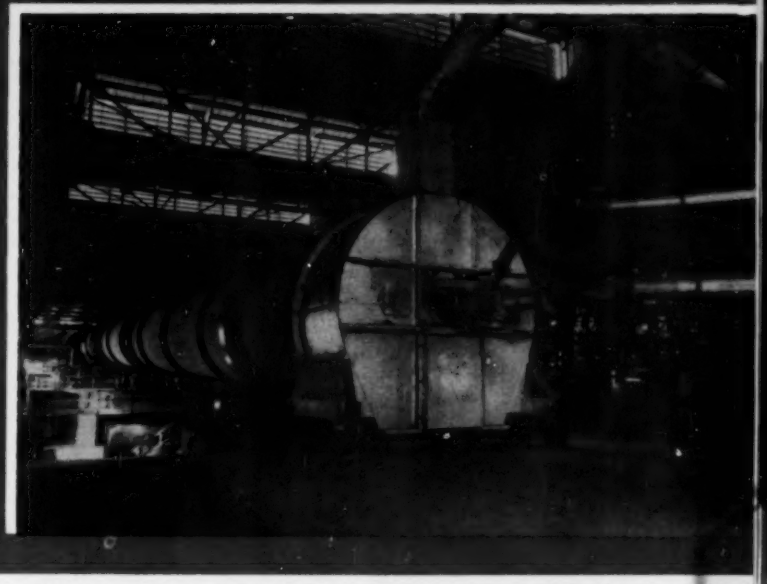
PLANT No. 1 of the Canada Cement Company, located at Montreal East, Quebec, Canada, might be said to typify the growth of Canada and of its cement industry. Built in 1905-07 by the Lakefield Portland Cement Company, it was taken over in 1910 to become Canada Cement's main plant. It was enlarged and improved then and again in 1929-31, when it was converted to the wet process, one of a number of such conversions carried out by the company over a period of several years. At the latter date improvements included the first four of the six present kilns (replacing 17 old small kilns), a new crushing building, five new raw grinding mills, etc. In 1938 direct-firing coal pulverizers replaced the old bin system, and in 1942 the No. 5 kiln was added, primarily for the production of high-early-strength cement. In 1945 the post-war demand required further expansion, and the No. 6 kiln—complete with coal-handling system—was added, as well as new coal mills for the other kilns, additional coolers, raw-grinding mills, etc. A new high-capacity bulk truck loading plant was also built, and the quarry was converted to truck haulage.

While all this expansion was taking place, the city of Montreal continued to expand toward the plant, and control of dust became a problem. Individual dust collecting systems in the various plant departments helped but did not completely solve this problem. Late in 1948 ground was broken for a new Western Precipitation Corporation Cottrell electrical precipitator to take the dust out of the exit gases of all six kilns. This unit went into operation early in 1950, and it is already meeting its guarantees.

The plant as it now stands ranks with the best in most departments. Efficiency is high and costs are low (due partly to cheap hydro-electric power), and the plant's kiln capacity of 17,700 Canadian bbls. daily makes it one of the three or four largest plants in the world. The oxygen analysis system of kiln control is of particular interest. The next and final step in the improvement of this plant will be the modernization of the clinker grinding department.

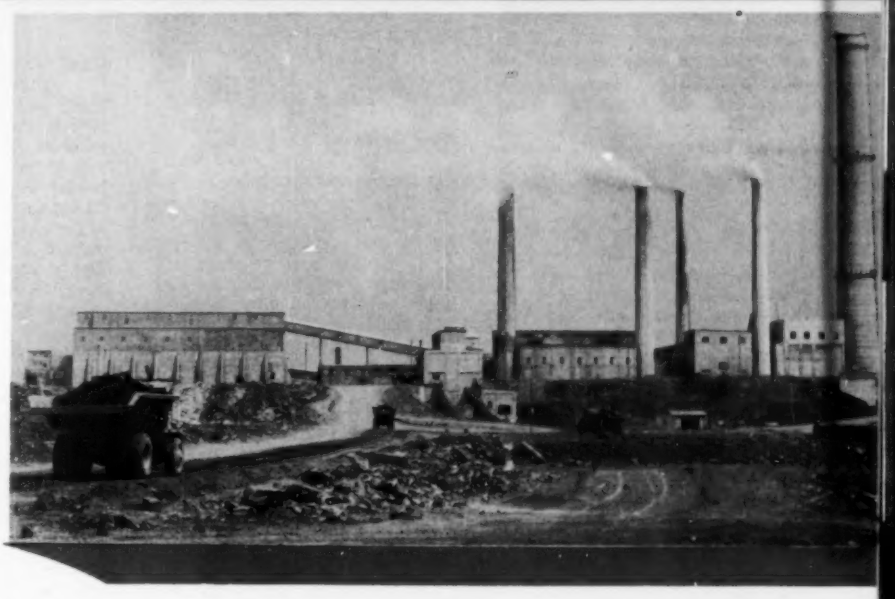
This plant has many other features which make it one of the most interesting operations in the industry. It is blessed with a limestone deposit which is said to be the only one in Canada having characteristics similar to the famous cement rock of the Lehigh Valley in Pennsylvania. No clay or shale and only very small amounts of high-calcium

Efficient dust control added to the many features which rank Canada Cement Company's No. 1 plant among the largest and most efficient in operation



Above left: General view of Canada Cement Company's East Montreal Plant with crusher building, electrical precipitator and new stack at left and new truck loading building at right.

Above right: The new 11-ft., 3-in. by 10-ft. by 11-ft. 3-in. by 430-ft. all-welded kiln from firing end.



Right: Another view of the plant from the quarry, with 15-ton truck in foreground and new precipitator and stack at right. When these photos were taken these had not yet been cut in and the old stacks were still in use.

stone and silica are needed to obtain the desired mix. Also important is the fact that this deposit is on the St. Lawrence River, making available all the advantages of water transport. The plant dock has facilities for unloading coal and gypsum from Nova Scotia and for loading bulk cement into self-unloading boats for the company's packing plants at Quebec City, Chatham, New Brunswick and Halifax, Nova Scotia.

Quarry The quarry is in the Trenton limestone, a comparatively soft rock with an average analysis of about 42 percent CaO, 13 percent SiO_2, 4 percent Al_2O_3, 1.7 percent Fe_2O_3, 2.3 percent MgO and an ignition loss of about 35 percent. This stone requires only minor correction in the plant, but considerable selectivity is necessary in quarrying. It was partly for this reason that in 1948 the old locomotives and cars used for haulage to the plant were replaced with nine 15-ton capacity Euclid trucks which are powered with 190-hp. General Motors diesel engines. These trucks make it possible to follow a pattern of development which was worked out following the war years; it is based on a complete geological survey of the deposit. This survey, incidentally, showed that an unlimited supply of good stone is available at this location.

The quarry now has an 80-ft. face and can be worked much deeper when necessary. The 6-in. churn drills have been supplemented with a Bucyrus-Erie 29T drill with 9-in. bits. These drills and the use of Canadian Industries, Ltd., C.I.L. interval timers for progressive blasting have resulted in more eco-

• At the quarry one of the trucks receives a 15-ton load of rock from a 3½ -cu. yd. shovel for the 200-ft. haul to the crusher.

nomical quarrying, with good fragmentation of the rock. The 9-in. blast holes are spaced 20- by 22-ft., and 20-millisecond intervals are used in blasting. Three Bucyrus-Erie electric shovels load the trucks —a 120B with a 4½-cu. yd. dipper, and two 85B's, with 3½-cu. yd. dippers. The distance hauled to the plant varies from 2000 to 3000 ft.

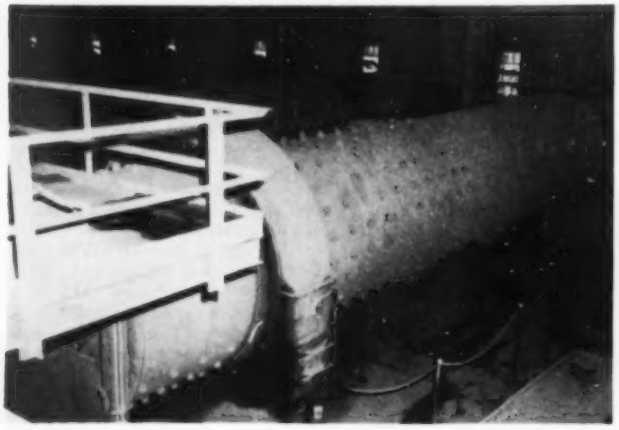
Crushing At the crushing building, which is just across the highway from the cement plant, the trucks are driven up a ramp to discharge into the hopper of the 54-in. Traylor primary gyratory crusher (said to be the largest in any cement plant). This is driven by a 250-hp. motor and reduces the rock to 7-in. minus at the rate of 750 t.p.h. Two 48-in. pan conveyors feed the rock to a pair of Pennsylvania SXT14 hammermills which crush to ¾-in. minus. Parallel belt conveyors carry this mill-feed rock through a tunnel under the highway to the 32,000-ton-capacity raw-rock-storage section of the plant storage building.

Raw Grinding An overhead traveling crane with a clamshell bucket distributes the rock in storage from which it is reclaimed by reciprocating pan feeders and fed by pan conveyors to the seven F. L. Smidth raw grinding mills. Sandstone and high-calcium limestone, used in the manufacture of high-early-strength cement, are handled in the same manner. The two 8- by 46-ft., three-compartment Unidan mills installed in 1947 are driven through Symetro drives by 1,100-hp. synchronous motors which have power factor meters. The five older 210- x 8.5-meter four-compartment Uni-Kom mills are driven by 800-hp. motors, also through Symetro drives. The new Unidan mills have a 5/16 in. rubber lining between their steel linings and shells and carry a 76-ton load of ¾- to 5-in. steel grinding balls. The product of these mills is a 90+ percent through —200 mesh slurry with a moisture content of 34 percent. The capacity of this department is 700 Canadian (350 lb.) bbls. per hr.

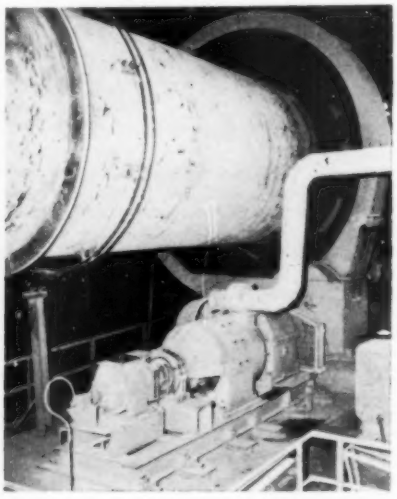
Wilfley 6-in. pumps feed the slurry to six 1,600-bbl. capacity Smidth correcting tanks with mechanical and air agitation. From these it is withdrawn as desired to the 25- by 125-ft., 7,000-bbl. capacity Smidth mixing or blending basin, which has a traveling agitator. Thence it goes into two 18,000-bbl., 35- by 207-ft. mechanical and air agitators. From these the slurry, averaging 41.5 percent CaO, is pumped to the kiln ferris wheel feeders.

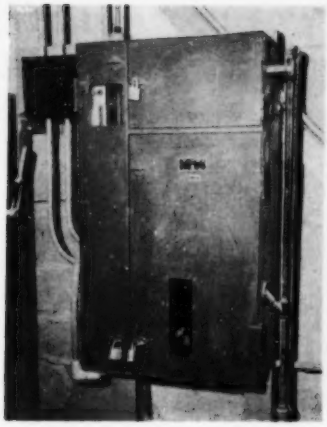
Coal The ¾-in. minus coal used in this plant comes from Nova Scotia by steamship and is unloaded at the dock into hoppers. It is rated at 13,000 B.t.u.'s and has an 8 to 9 percent ash content. It is hauled in 50-ton hopper cars, by Canadian G.E. electric locomotives, to the plant. A Robins car shakeout unloads a car in about 5 minutes into a self-cleaning hopper. A 54-in. apron feeder discharges the coal on a 36-in. belt conveyor which discharges it into a row of six new 300-ton conical-bottom reinforced concrete silos. Each silo holds

• The two new 7- by 46-ft. raw-grinding mills.



• The drive of the new kiln, with the motor-cooling fan and duct at the right.





• Left: The oxygen analyzer which provides basic control for the kilns.

• Right: The cooler on one of the old kilns.

enough coal to operate the kiln for 48 hrs.

Under each silo is a variable-speed table feeder to one of the six direct-firing tube mills. Kilns 1 to 4 and No. 6 are fired by 5½- by 22-ft. air-swept tube mills of the company's design, driven by 125-hp. motors. Kiln No. 5 is fired by a 4½- by 16-ft. Smidth Tirax mill. These three-compartment mills all have 5-ft. drying chambers in their feed ends. The second (5 ft. 10 in.) compartment of each mill is charged with 6,000 lbs. of 2-in. grinding balls, and the third (11 ft. 1 in.) compartment has 12,000 lbs. of 1¼-in. balls.

These mills draw their air for drying the coal from the kiln hoods, and the amount of this air can be varied with the amount of moisture in the coal. Temperatures as high as 600 deg. F. can be used. The temperature of the coal-air mix going into the kilns is from 170 to 200 deg. F. Each mill has a capacity of about 5 tons of coal per hr., grinding to a fineness of about 90 percent passing 100 mesh. The burner pipes are insulated with asbestos cement inside the kiln, protected by heat-resisting steel sleeves.

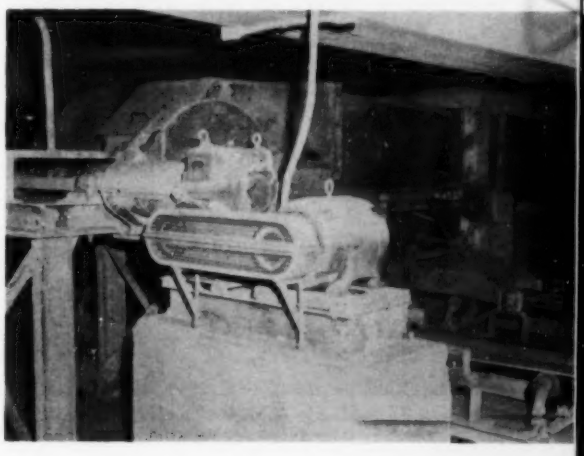
Kilns The four kilns (No. 1 to No. 4) installed in 1929-31, are 11 ft. 3 in., 10 ft. and 11 ft. 3 in. in diameter and 361 ft. long. Kiln No. 5, added in 1942, is 9- by 8- by 9-ft. in diameter and 324 ft. long. The new kiln (No. 6) is 11 ft. 3 in. by 10 ft. by 11 ft. 3 in. in diameter and 430 ft. long and is of all-welded construction; the others are riveted. All are F. L. Smidth kilns and have Smidth dense heat-exchanging chain systems, and reduced-diameter calcining zones. Kilns No. 1 to No. 5 have Unax coolers which have been redesigned and rebuilt. Kiln No. 6 has an air-quenching cooler of the company's own design. All the kilns are lined in their burning zones with Canadian Refractories Magnecon fully-burned basic magnesite brick. This type of refractory is said to stand up under repeated starts and stops better than the chemically-bonded refractories formerly used. The balance of each kiln is lined with 70 percent alumina, and super-duty brick, except for the chain sections, where wear block is used.

All of the kilns are supported on six tires and each kiln is driven by a variable-speed d.-c. motor through gear reducers. Kilns 1 to 4 have 75-hp. motors. Kiln No. 5 has a 60-hp. motor and No. 6 has a 100-150-hp. motor; all have stand-by gasoline engines. All kiln drive motors have ventilating systems which draw cooling air through a filter in the wall of the kiln building. Each kiln drive motor has an attached generator to synchronize its slurry feeder motor.

Each kiln is fired under induced draft and louvres at the back end are controlled from the burner's platform. Burning conditions in the kilns are controlled by varying the rate of coal feed; as far as possible all other variables such as kiln speed, primary-secondary air ratios, etc., are kept constant. The controls for each kiln are centralized in individual Smidth control panels on which are mounted all the required indicating and recording instruments, gauges, etc.

Kiln No. 6 is equipped with a gas analyzer, making possible better control: and because of its greater length and other features, it is the most efficient of these kilns. It is fired at 2,700 deg. F. with a short intense flame, and all the combustion air, except for the 20 percent of 600-deg. primary air from the coal mills, is preheated air from the hot zone of the clinker cooler. A draft of .02 in. is maintained at the feed end, and exit gas temperature is about 550 deg. F.

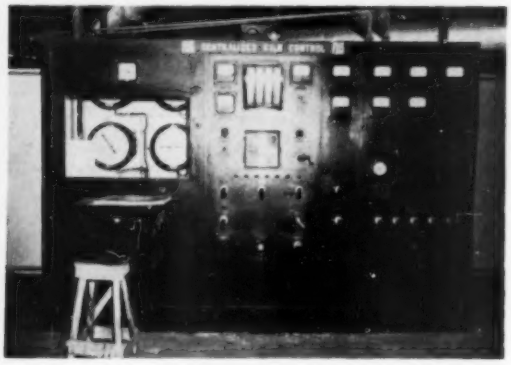
The Leeds & Northrup oxygen analyzer operates electrically and has no mechanical moving parts. It takes continuous gas samples at the back end of the kiln and measures the oxygen by removing it through combustion with hydrogen. The reading at the kiln panel is the difference between the thermal conductivity of the gas mixture before and after combustion. This analyzer detects changes in burning conditions in one to two minutes, as compared with 15 to 20 minutes when exit gas temperature readings are used as a guide. The analyzer



• The secondary cooler for Kiln No. 5.

• The "Narsted" chain grate clinker cooler on Kiln No. 6.

• The control board for the new No. 6 Kiln, with the oxygen analyzer at the left.



also quickly indicates the lack of coal, or a change in its quality. The draft fan is constant speed, and draft changes are made by louvre adjustments. The analyzer and a thermo couple at the chain section which records exit gas temperatures are used to adjust burning conditions, and together they tell the burner everything he needs to know to keep the kiln operating at peak efficiency.

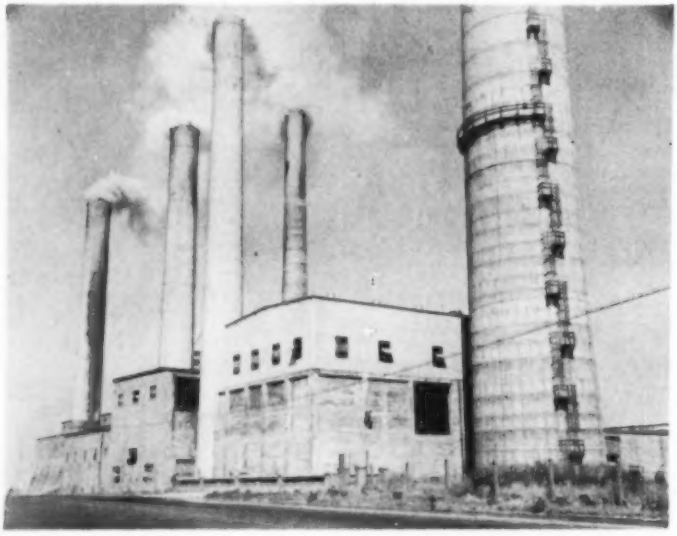
All of the kilns have been pushed above their most efficient capacities because of the cement shortage which has existed in Canada. Under these conditions the capacities of the kilns range from 1,700 (Canadian) bbls. for No. 5 to 4,000 bbls. for No. 6. Kilns 1 to 4 normally produce, 2,200 bbls. of clinker daily but are now pushed up to 3,000 bbls. This increased output has been attained with a fuel consumption of about 1,300,000 B.t.u's for Kiln No. 5 and 950,000 b.t.u.'s (70 lbs. of coal) for No. 6. The other four kilns have been using about 1,100,000 B.T.u.'s

Coolers It has been stated that Kilns 1 to 5 are equipped with Smidth Unax integral coolers. They are now followed by secondary coolers of the company's own design. These are oven-shaped coolers with 18-in. drag chain conveyors running on rails above a grate. Cooling air from a chamber below comes up through the 8-in. bed of clinker on the drag chain. These coolers receive the clinker at a temperature of about 400 deg. F. and cool it to about 150 deg. F.

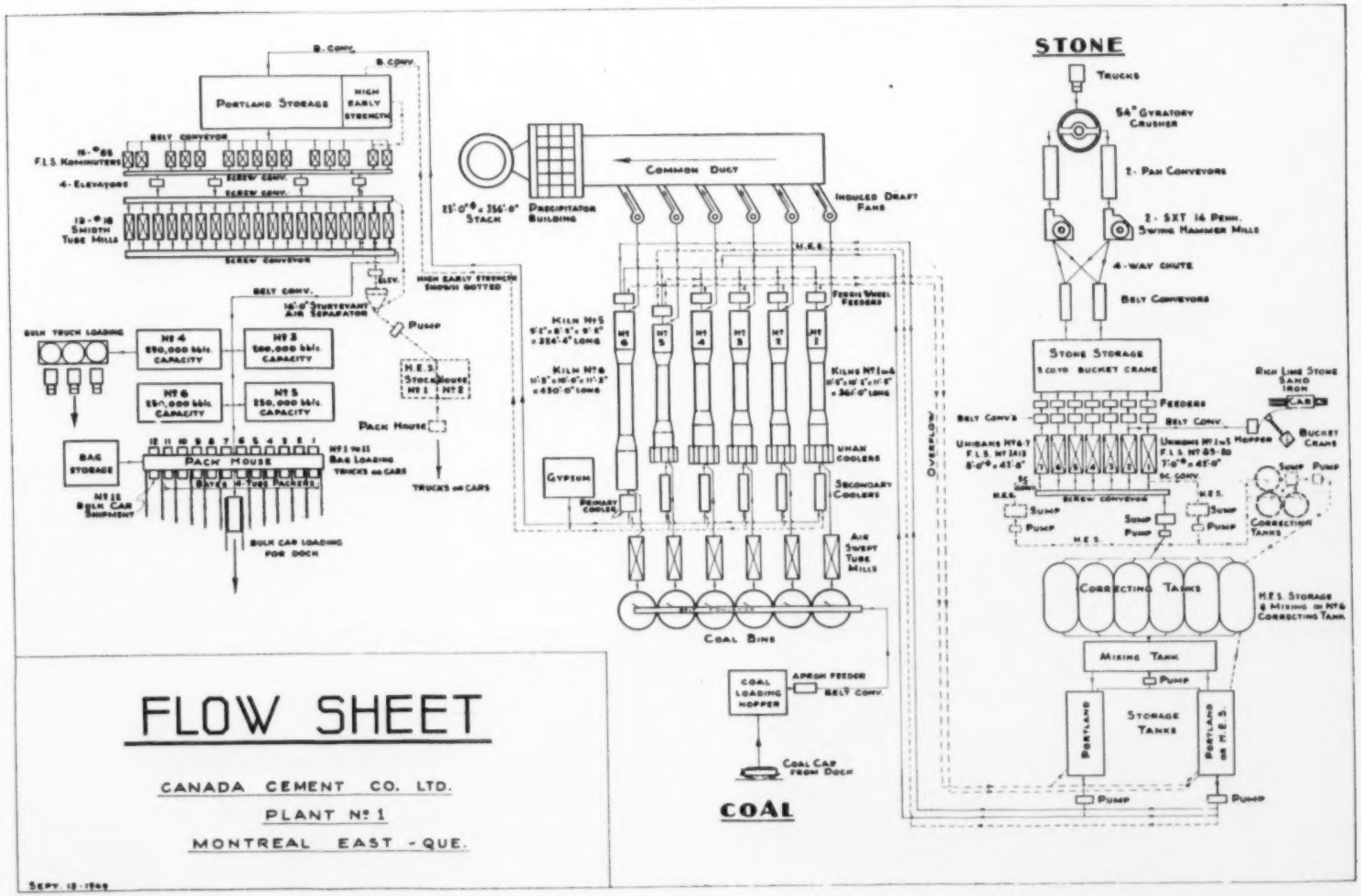
Kiln No. 6 is followed by a "Narsted" cooler designed by John Narsted, vice-president in charge of production, who was for many years chief engineer of the company. This is a horizontal grate-type air-quenching cooler with a refractory lined shell. It has a stationary 6- by 32-ft. grate over which the clinker is carried by a heavy cast-steel drag chain conveyor. The conveyor is driven by a Vickers hydraulic unit which provides accurate variable-speed control and eliminates the use of drive sprockets and chains. The depth of the clinker bed is kept at about 8 in. Cooling air is supplied at 65,000 c.f.m. by a Buffalo fan driven by a 175-hp. motor. A butterfly valve controls the amount of air going to the primary and secondary sections of the cooler. The hot air from this first section comprises all the secondary air for the kiln, and the cooler air from the secondary section is wasted to atmosphere.

The clinker, which reaches a maximum temperature of 2,700 deg. F. in the kiln, enters the cooler at 2,200 deg. F. and is discharged from it at about 150 deg. F.

The clinker from the secondary coolers of Kilns 1 to 4 and the No. 6 cooler is discharged on 24-in. high-temperature rubber belts operating at a speed of 350 f.p.m. Ordinarily it goes on a series of conveyors, the first discharging to the clinker section of the storage building and the second to the finish mill feed bins. For emergency use there is a second parallel belt conveyor to the clinker storage usually used for high-early clinker, which is reclaimed from storage by a McCaslin conveyor.



This view of the Montreal plant shows the new electrical precipitator and stack shortly before they were cut into the circuit. The old stacks at the left will be torn down.



FLOW SHEET

CANADA CEMENT CO. LTD.

PLANT No 1

MONTREAL EAST - QUE.

Sept. 12-1949

• To speed up unloading of coal, a mechanical car shaker is used.

Finish Grinding and Storage The finish grinding department was built in 1914 and is slated for early replacement. The belt conveyors feed clinker and gypsum to the feed bins of the 15 Smidth No. 85 Kominuters, which do the preliminary grinding. Finish grinding is done in 19 Smidth No. 18 tube mills. Three of these latter mills are connected to a 16-ft. Sturtevant separator for the production of high-early-strength cement, which is ground to a surface area of 2,700 cm^2/gm. Standard portland cement (Type I) is ground in open circuit as the Canadian requirement for this type is 82 percent through 200 mesh.

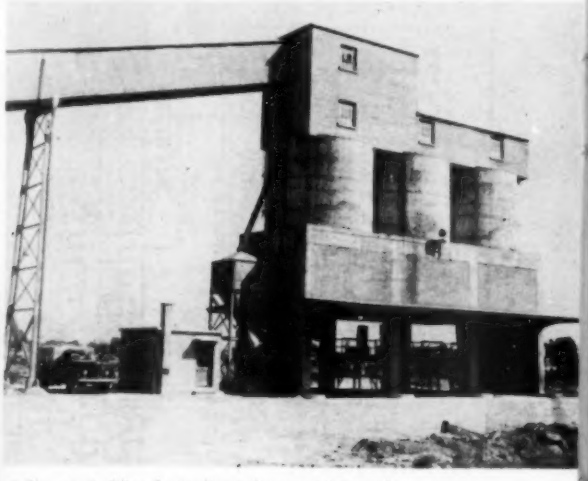
The high early cement goes via a Fuller-Kinyon pumping system to a stock-house. The Type I cement is carried on belt conveyors to five more stockhouses. These are of concrete construction, and reclamation from them is by means of screw conveyors. The six stockhouses have a combined storage capacity for 1,000,000 bbls.

Packing and Loading The packing and shipping facilities at this plant are on a scale commensurate with its size. Belt conveyors feed Type I cement to 11 St. Regis four-spout bag packers in a row of separate buildings—each packer having its own car and truck-loading shuttle conveyor. Another four-spout machine in an individual building is for high-early cement. Sacked cement for water shipment is palletized and hauled by trailer trucks to city docks. Bulk cars are also loaded for direct shipment or to move the cement one-half mile to the dock for boat loading. Barrels can also be loaded for export. About 20 percent of the plant output is shipped in bulk.

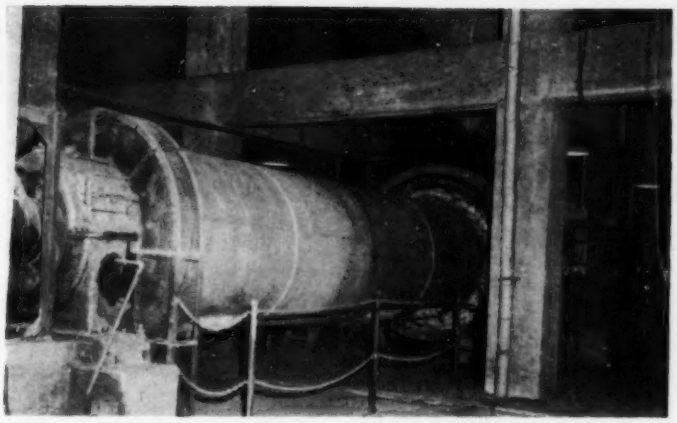
A separate building was built in 1938 for loading bulk cement into trucks for shipment. Because of the growing demand for bulk cement, this was recently enlarged so that three trucks can now be loaded at one time from concrete bins with steel bottoms. These shipments are weighed on a truck scale alongside the building.

Stack Dust Collection Construction of the Cottrell electrical precipitator for this plant was begun late in 1948 by the Precipitation Company of Canada, a Canadian subsidiary of the Western Precipitation Corp. It was nearly ready for operation when this plant was visited late in 1949. Designed to serve all six kilns, this installation is rated at 750,000 c.f.m. at 450 deg. F. The guaranteed efficiency is 96 percent by weight of incoming solid dust, but 98 percent efficiency is expected, judging from experience to date. The precipitator is a reinforced-concrete structure in two separate three-unit sections to provide for future expansion. Units 1 and 2 have 25-duct rod-curtain collecting electrodes, and the third or outlet section has 20-duct pocket electrodes. The gases from the six kiln-draft fans rise through in-

• The six new 300-ton coal storage silos over the coal mill's.



• The new building for loading bulk cement into trucks.



● The No. 4 air-swept coal mill—5½ by 22 ft.

dividual ducts into a long common duct to the inlet flue of the precipitator, entering at a temperature of 400-450 deg. F. The gases from the precipitator go to the new 350-ft-high Custodis reinforced-concrete stack. This has an independent brick lining for its full height and an interior diameter of 23 ft. at the top. The lining is of common red clay brick laid up in Kalicrete mortar, made with Canada's sulphate-resisting cement. The four old stacks—one for kilns 1 and 2, one for kilns 3 and 4, and one each for kilns 5 and 6—will be demolished eventually. Methods for disposing of the dust are under consideration, some of it is being returned to the circuit. Fuller-Huron Airslides are used under the precipitator hoppers.

General The Canada Cement Company has its headquarters in the Canada Cement Building, Montreal, Quebec. Its other cement-producing plants are located at Hull, Quebec; Belleville, and Port Colborne, Ont; Exshaw, Alberta; and Fort Whyte, Manitoba. It also operates storage and packing plants at Windsor and Toronto, Ont.; Quebec City, Quebec; Chatham, New Brunswick; and Halifax, Nova Scotia. Cement is transported to these points from the Montreal, Belleville, and Port Colborne plants, all of which are on the shores of the Great Lakes, by two self-unloading boats, the *Bulkarier* and the *Cementkarrier*, operated by Canada Cement Transport, Ltd. These also haul coal and gypsum to these plants from Nova Scotia and American ports on the Great Lakes.

Officers of the company are as follows: J. D. Johnson, chairman of the board; J. M. Breen, president and general manager; W. O. Bovard, vice-president in charge of sales; John Narsted, vice-president in charge of production; G. A. Russell, vice-president, secretary, and treasurer. V. C. Hamilton is general superintendent, A. S. Dies is technical supervisor of operations, Dr. W. S. Weaver is chief chemist, and H. B. Howe is chief engineer. Taylor Kennedy is superintendent of the Montreal plant, with J. A. Grosskurth as assistant. L. E. Shipley is chief chemist of this plant.

Safety Council Presents Safetygraph for Industry

A new "safetygraph," showing why falls are one of the most serious of all industrial accident hazards, how they occur, and how to prevent them, has been prepared by the National Safety Council. Designed as a visual aid for training small groups, it consists of 12 spiral-bound pages, inserted in a leatherette portfolio.

This new safetygraph is the latest in a series of 16 published by the Council. One out of every four accidental deaths are caused by falls, the Council points out, and the illustrations show the hazards of ladders, scaffolds, makeshift equipment, slippery or cluttered floors, stairways, unprotected openings and horseplay.

Prices for this new safetygraph on falls, or for others in the series, may be obtained on request to the National Safety Council, 425 North Michigan Ave., Chicago 11, Ill.

Effect of Gypsum

(*From page* 88)

pared of clinker included in these investigations is markedly dependent on the W/C-ratio of the mix applied for determination of the compressive strength. The drop in compressive strength with increasing W/C-ratio is more pronounced for cements with high gypsum content then for cements low in gypsum.

Persons Authors Booklet on Portland Cement Industry

A considerable amount of heretofore unpublished information about the portland cement industry is incorporated in an excellent 50-page booklet which is one in a series of studies of American industries. The author is Hubert C. Persons, manager of the public relations bureau of the Portland Cement Association.

In addition to his able coverage of relatively familiar aspects of the cement industry, such as its history, the raw materials used, and the methods of manufacture, the author has incorporated altogether new material on the functional organization of cement mills, and the qualifications for employment in the industry. Of particular interest to the trade is an analytical index of occupations, describing 43 job classifications applicable to average mill practice.

Hubert C. Persons

Mr. Persons, who has been on the staff of the Portland Cement Association since 1934, is also the author of *Drama of Cement Making* and the *History and Development of Concrete Highways*. Copies of his latest work, *The Portland Cement Industry*, may be obtained from the Bellman Publishing Co., Inc., 83 Newbury St., Boston, Mass.

Impressive Ceremonies Mark Dedication of P.C.A.'s Research And Development Laboratories

By WILLIAM M. AVERY

another ON THE SPOT report

MORE than 500 of the nation's top-ranking scientists, engineers and technicians took part in the impressive ceremonies which marked the dedication on June 8 of the Portland Cement Association's new research and development laboratories at Skokie, Ill. Fine weather, a panel of top-notch speakers, and excellent staging combined to make the affair one of the most successful occasions of its kind we have attended. Major addresses were presented by Frank T. Sheets, president of the association, Charles F. Kettering of General Motors Corporation, Dr. A. Allan Bates, P.C.A.'s vice-president for research and development, and Walter C. Russell, chairman of the board.

• Frank T. Sheets, president of P.C.A., speaking on "The Mission of the Portland Cement Association" at the dedication ceremonies.

• Dr. A. Allan Bates (left), P.C.A.'s vice-president for research and development, and Charles F. Kettering, a vice-president of General Motors Corporation and research consultant, discuss the merits of a pre-stressed I-beam.

In his opening remarks Mr. Sheets pointed out that the occasion had a broader significance than the dedication of mere buildings. "We are also," he said, "dedicating the spirit, the integrity, the intelligence and the productive powers of the men and women who will work here—all for the expansion of knowledge, for the improvement of product, for the extension of use—in the public interest and to build a greater America."

"It is our belief in the future of portland cement," Mr. Sheets said, "and our confidence in the future of America that has led this association to expend approximately three million dollars in the construction and equipping of these laboratories for exploration of the unknown and for the improvement of tomorrow's practice."

In an address appropriately entitled *Research and Reality* Dr. Bates called attention to some of the broad functions of the new laboratories. Noting the impatience and concern which are sometimes expressed concerning the time lapse between research and practice, he described the manner in which the association endeavors to bridge this gap.

"To learn by trial and error or

• A general view of guests and the speakers' platform at the dedication ceremonies of the Portland Cement Association's new $3,000,000 research and development laboratories at Skokie, Ill., June 8, 1950.

by empirical means alone," Dr. Bates said, "all that we should know about concrete and its use would be an endless and hopeless task . . . The elements of complexity and variety introduce so many uncertainties that we must confirm by many practical field tests every conclusion reached by fundamental chemical and physical research.

"Since these laboratories were founded a generation ago," the speaker said, "the association has expended well over a million dollars on fundamental research—but many times that amount on practical testing and study of field construction methods. . . . Such field experiments on a vast scale conducted over decades of time . . . are our means of translating our research into realization, of transforming theory into practical reality."

Later in his address Dr. Bates struck a sober note in referring to the possibility of atomic war. "The best chance," he pointed out, "that an urban civilization has of surviving atomic warfare is to make maximum use of concrete in building its towns and cities. Reinforced concrete structures, properly designed, possess a unique combination of impenetrability to deadly nuclear radiation, resistance to blast destruction, safety against fire, and last but not least, economic feasibility.

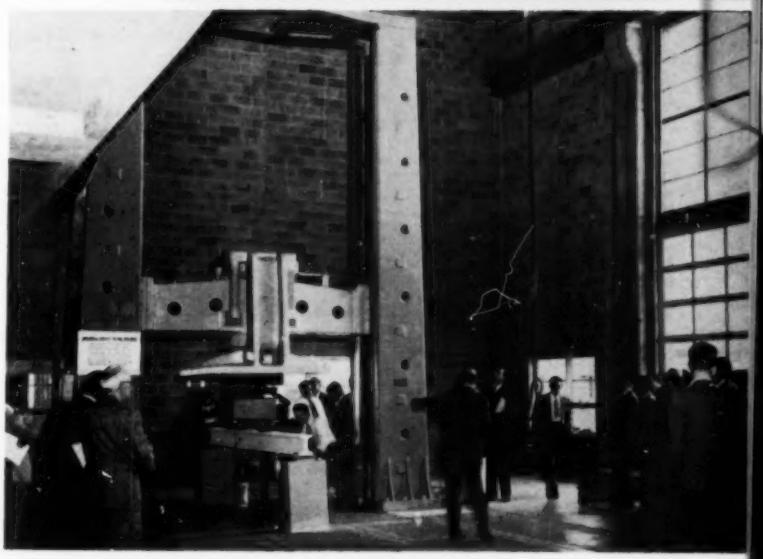
Mr. Kettering, as guest speaker, related several humorous incidents from his own wide experience with research problems. He emphasized the importance of such unfettered research programs as the Portland Cement Association's, and the great benefits that ultimately accrue to the general public as a result of them. He referred also to the new research center which General Motors Corporation is building.

Following the formal dedication by Mr. Russell, visitors were conducted on an inspection trip of the more than 30 laboratories which make up the new research center. The structures themselves, and the facilities which they house, were fully described in the June issue of PIT AND QUARRY, pages 64 to 70.

• These guests are examining the control cabinet of a compression testing machine in the physical testing room. This machine is capable of exerting up to 330,000 lbs. of pressure on a concrete specimen.

• Walter C. Russell (Peerless Cement Corporation), chairman of P.C.A.'s board of directors, conducts the formal dedication of the new laboratories.

• This display showed bond transfer procedure. In the production of decorative treatments in cast-in-place architectural concrete through exposure of selected aggregate, the bond transfer procedure is incorporated near the surface.



• Right: Guests are watching a prestressed concrete I-beam being tested by a huge compression testing machine capable of exerting up to 1,000,000 lbs. of pressure.

Loading the Rotary Kiln

By RALPH E. GIBBS
Consulting Chemical Engineer
York, Pa.

another P and Q exclusive

THE variables that are possible with any rotary kiln operation are almost without number. It is for this reason that the problem of establishing the best possible operating conditions of a unit seem so complex. Nor is this situation at all simplified by the diverse interpretations of the observed phenomena made by those who are studying them. Frequently these interpretations are not based on the complete facts associated with the phenomena under study, with the result that the deductions are not truths.

Uniformity undoubtedly is the fundamental rule or law governing the result or outcome of any natural process. The operation of the rotary kiln is no exception. The nearer the approach to uniformity in conducting the process, the closer will be the attainment of the desired results.

The cement industry seems to appreciate, more than other industries using rotary kilns, the potency of this law of uniformity. As a whole, it goes to great pains and expense to assure the uniformity of the kiln feed in order that the product will be consistent in both chemical and physical qualities. It attempts to maintain as uniformly as possible the conditions controlling combustion, and the cooling, storage, and grinding of the clinker.

On the other hand, there seems to be a lack of agreement, not only in the cement industry, but in all industries using the rotary kiln, on the optimum loading or depth of burden to be carried in the kiln.

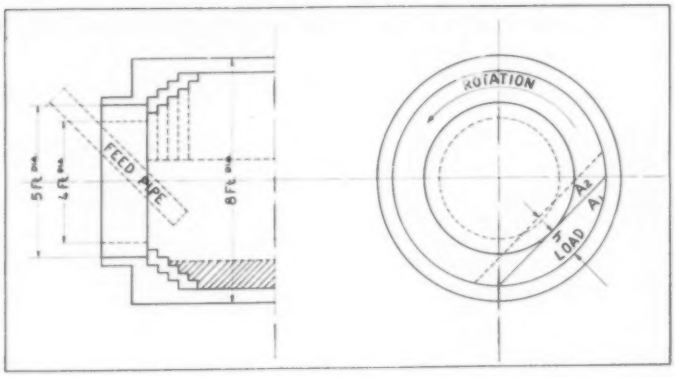


Figure II

This is rather startling since it is highly probable that no other variable connected with rotary kiln processing has such a great influence on the final results.

The loading of the kiln can be made to contribute a high degree of stability to the burning or clinkering process. When the kiln is properly loaded, the loading provides an inertial, or fly-wheel effect, which can be attained in no other way. The very mass of material involved will smooth out irregularities of temperature variations as they affect the degree of burning or clinkering, and generally results not only in improvement to the quality and uniformity of the product, but also reduces the heat requirement per unit weight of product by increasing the production rate.

To a limited extent, the physical dimensions of the rotary kiln will govern the maximum possible production rate and the minimum processing heat requirements. These physical dimensions are effective also in limiting the quantity of material under process, and the length of the processing time. The speed of rotation, dams or corbles, and other possible arrangements, all have an effect on the rate of flow of the material through the kiln; but by all practical operating standards, the physical dimensions of the kiln establish its nominal production rate.

The high limit of the production rate of any rotary kiln is determined by the quantity rate at which heat can be introduced into the process as a whole, and by the proportion of this heat which is usefully and directly applied to the process proper. The rate at which the heat is absorbed by the process is, fundamentally, one of temperature difference; and the rate at which heat can be developed in a system such

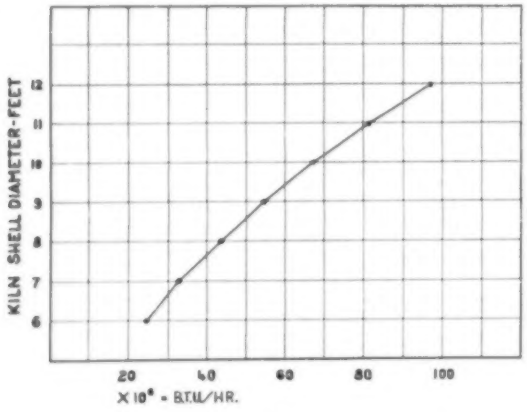


Figure I

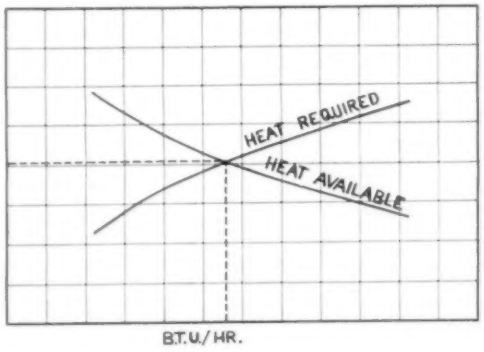


Figure III

SLY

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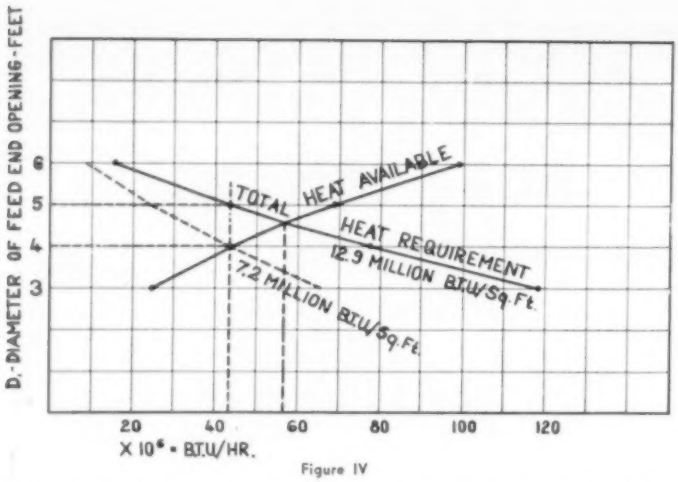

Figure IV

as the rotary kiln, and to have this heat used effectively, is limited largely by one of the kiln's physical dimensions; the kiln diameter.

The velocity of the gases in the combustion zone seems to regulate the rate at which the fuel can be burned most effectively. In practice it has been found that this velocity is such that about 850,000 to 900,000 B.t.u.'s/hr./sq. ft. of kiln shell cross sectional area can be developed. Thus

$$\frac{D^2 \times 3.14 \times 850{,}000}{4} =$$

670,000 D^2 B.t.u.'s/hr.

is the nominal rate of heat development for the system. D is the kiln shell diameter in feet. The following table and graph (Figure I) illustrate this relation.

D Feet	Nominal Heat Development Rate B.t.u.'s/hr.
6	24,100,000
7	32,800,000
8	43,500,000
9	54,200,000
10	67,000,000
11	81,000,000
12	96,500,000

From these data it is seen that the fuel-burning capacity of the kiln is quadrupled when the diameter is doubled. It might be presumed from this that the production capacity of the kiln also would be quadrupled; but the presumption would be erroneous. Actually it will be found that the production rate is more than octupled when the kiln shell diameter is doubled and the length properly proportioned.

The requirement for heat is dependent upon the quantity of material under process. And since the heat losses of a specific system are fairly constant, it is easily understood why these become proportionately less as the material quantity under process becomes greater. Consequently there are advantages in having as much material under process as the system is capable of holding.

There are two highly important factors in establishing the optimum kiln loading. One is the optimum heat development rate for the kiln; the other is the heat requirement rate. These can be related for any rotary kiln system selected.

The loading of the kiln generally is fixed by the opening at the feed end. This is shown in Figure II. This feature of the rotary kiln seems to be grossly neglected. Actually it is one of the most important points of the kiln, since it is this opening that limits the loading, and, in addition, limits the fuel-burning capacity of the system. Thus it is seen that the previous table and graph are the upper limits of the system's fuel burning capacity while the opening at the feed end of the kiln can limit the actual fuel-burning capacity below the maximum. Thus, with a fixed draft, this opening may be such as to fix the fuel-burning capacity at any possible value from zero to the maximum.

Returning to Figure II, it will be noted that with D fixed, the opening for the exit gases at D_1 can be made to have any practical diameter desired. As D_1 becomes smaller, the loading capacity of the kiln increases. When the draft is constant, the fuel-burning capacity of the system is decreased as D_1 decreases. Thus, with a fixed kiln shell diameter, speed of rotation, and draft, a decrease in D_1 will mean a decreased fuel-burning capacity, and an increase in fuel requirement per hour when the kiln is loaded to a capacity that is determined by D_1.

The letter (h) will be used to signify the depth of the load or burden. One method of illustrating the principle of the method the author has been using is shown in the following curves (See Figure III).

From this figure, it is seen that the trend of the two curves are opposed and relate the value of h to both the heat requirement and heat development possible with the system. If there were no limitations to the system, the optimum depth of the load and the optimum heats involved would be established at the point of intersection of the two curves. But since the practical rotary kiln systems do have limits imposed on them, these must be considered.

For the purpose of illustrating the author's method for establishing the optimum loading of the kiln, it may be best to use an example. For this purpose, it will be assumed that the kiln is 8 ft. in diameter and 160 ft. long, and produces 145 tons of product per day. It is lined with 6 in. brick. The draft is fixed at 1 in. WC. The kiln is unobstructed. The opening at the feed end (D_1) is 5 ft. in diameter, and the load has a depth of 1 ft.

From the previous table (for Figure I), it will be learned that the 8 ft. diameter kiln has a maximum heat development rate of 43.5 million B.t.u.'s/hr. This is equivalent to 7,250,000 B.t.u.'s/ton of product. In terms of coal, this is about 538 lbs./ton of product.

On the assumption that the product weighs 90 lbs./cu. ft., this kiln is operating at such a speed that it is delivering 133 cu. ft./hr. The cross-sectional area of the load will be 3.38 sq. ft., which means that the rate of travel through the kiln is about 34.4 ft./hr.

It has been the author's experience that with a draft of from 1 in. to 1½ in. at the feed end of an unobstructed kiln, the opening represented by the diameter D_1 is capable of handling the vapors and gases, developed in the kiln during processing, equivalent to 3,500,000 B.t.u.'s/hr. of developed heat.

In this example, the heat requirement of the load is

$$\frac{43{,}500{,}000}{3.38} = 12{,}900{,}000 \text{ B.t.u.'s/hr./sq. ft.}$$

of load cross-sectional area.

(Continued on page 125)

IT COSTS LESS TO OWN THE BEST!

It's New *and it's* News!

THE KENNEDY "STREAMLINE" CEMENT PLANT....

DESIGNED BY KVS ENGINEERS this plant meets every need for a sound, basic design which includes every element and all facilities necessary for the efficient and profitable production of all modern types of cement.

IT CAN BE BUILT AT MODERATE COST: Here is a plant designed to produce uniform quality cement at minimum cost and with fewer operations. Equipped with rugged KVS machinery and equipment, it operates smoothly and effects important savings in man-hours and man-jobs. Every factor is provided to maintain a competitive position and operate economically for years to come.

See inside

EXAMINE THE PLAN: Note how every department is designed and located to insure streamlined handling of all materials and products. Note also, the arrangement of machinery and equipment; special attention has been paid to conservation of space, elimination of lost motion and the installation of a fast-moving production line.

OPERATIONS IN EVERY DEPARTMENT have been made automatic. This provides maximium control of quality by chemists and operators and reduces to a minimum the need for highly skilled help. The best of modern flow-sheets has been combined in proper combination to insure the utmost usage of all machinery and obtain maximum results from power.

SIMPLIFIED TRANSPORTATION EQUIPMENT has been specified throughout. Note that only one pan conveyor and one screw type, together with seven trouble-free belt conveyors comprise the entire conveying group. This radical departure is a real improvement over conventional conveying systems such as elevators and screw conveyors and will result in definite savings in time and money.

CHECK OVER THE MANY UNUSUAL FEATURES of this new cement plant. Note the systematic arrangement of handling and storing raw materials and finished products. The succeeding page lists many of these innovations. KVS engineers will be glad to explain every function and advantage included in the Kennedy "Streamline" layout.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

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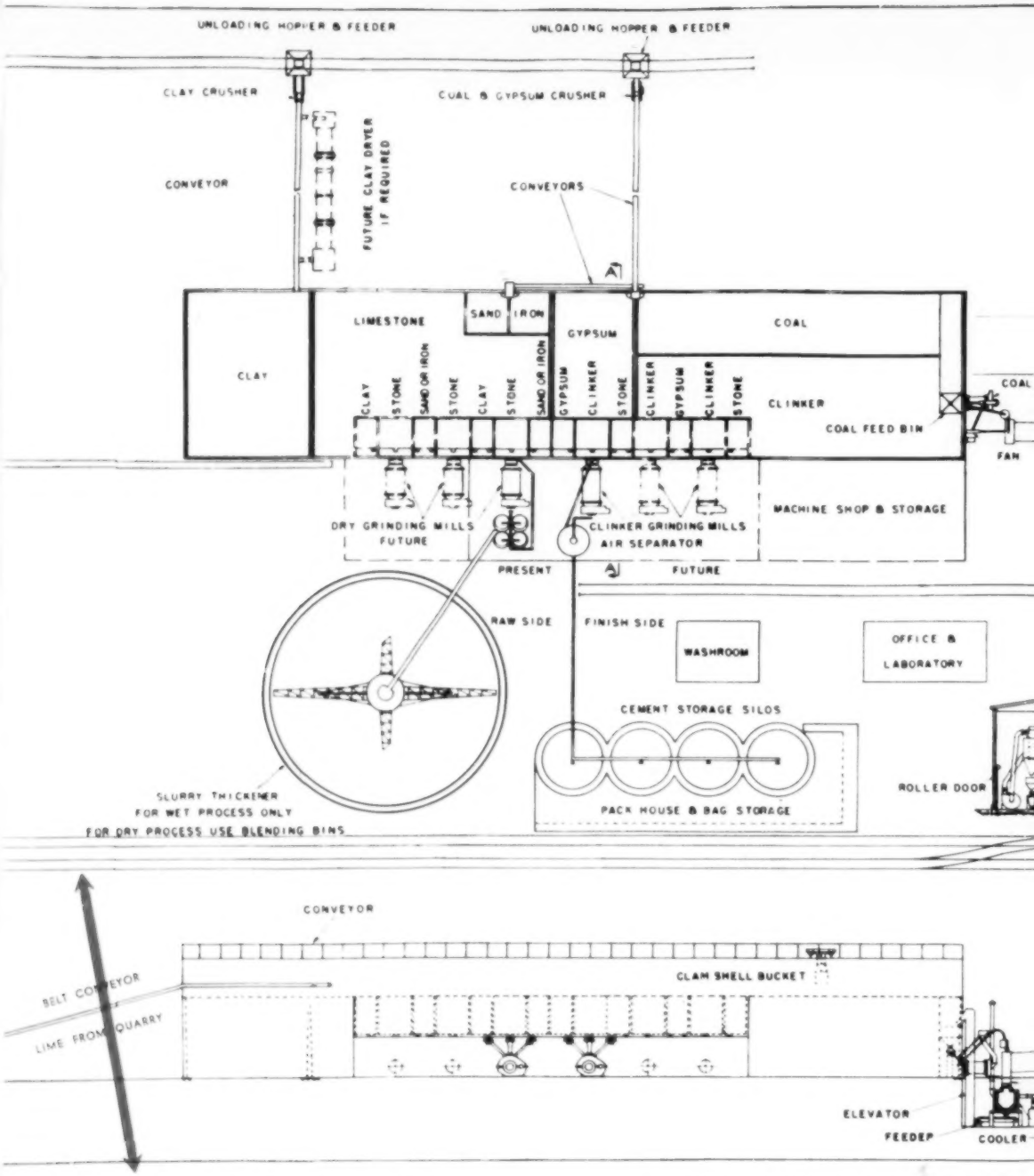
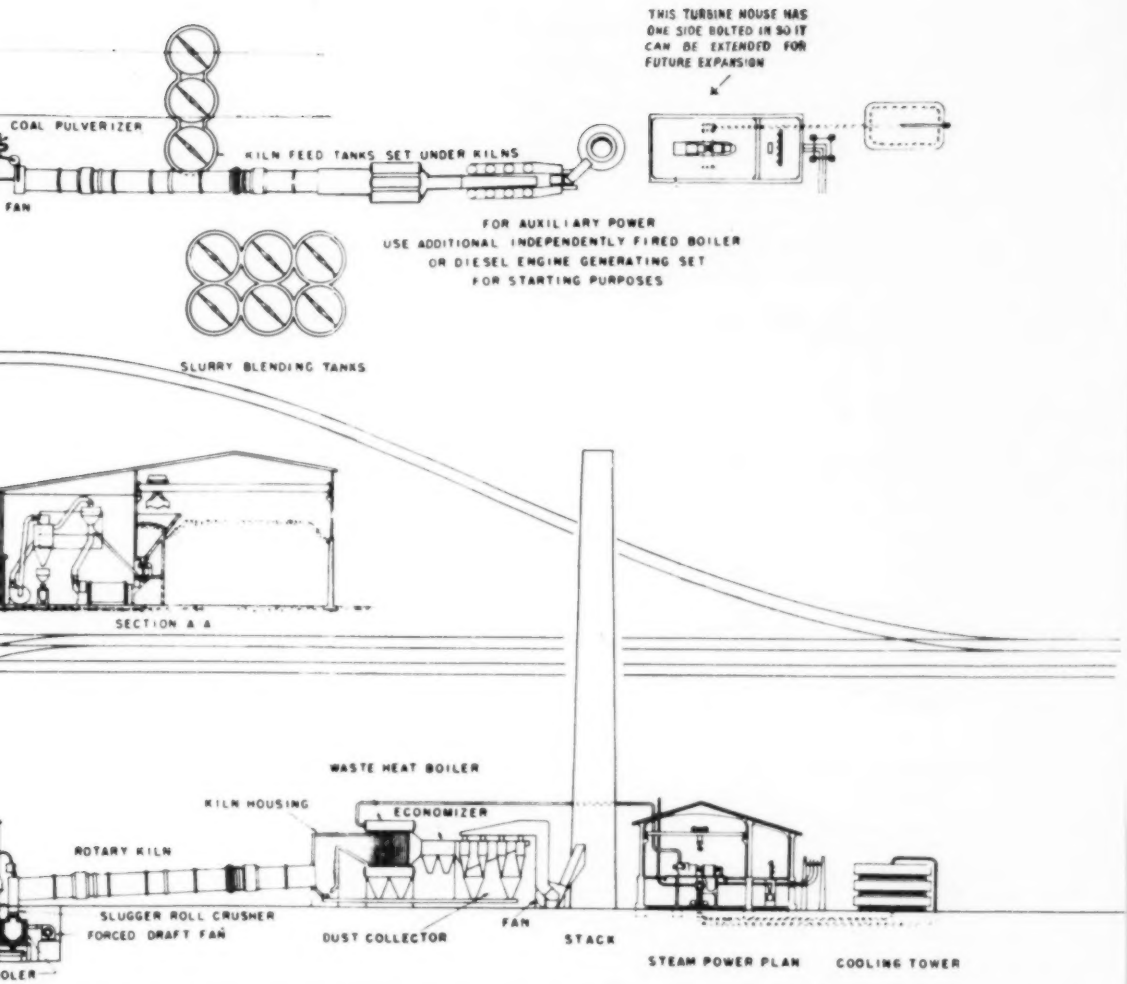


Primary and Secondary Crushers, Conveyors, Rock feeder and limestone bedding storage for blending grades of stone NOT SHOWN ON THIS PLAN. Marginal lines indicate locations.

TYPICAL KENNEDY WET-PROCESS
PORTLAND CEMENT PLA

Patented; and patents applied for.

To convert to DRY-PROCESS, the only change in p
stitution of dry raw material storage and blending sil
and slurry storage tanks.



SS "STREAMLINE" PLANT

for.

in plans shown is the sub-

ng silos for slurry thickeners

TO INCREASE CAPACITY OF PLANT

By 100% — install 1 add'l Kiln & Cooler
install 1 add'l Tube Mill for Raw & Finished Side

By 200% — install 2 add'l Kilns & Coolers
install 2 add'l Tube Mills for Raw & Finished Side

These additions can be added without interruption to operation of plant.

IT COSTS LESS TO OWN THE BEST!

SPECIAL FEATURES OF

THE KENNEDY "STREAMLINE" CEMENT PLANT...

ORIGINAL AND EXCLUSIVE ARRANGEMENTS OF DEPARTMENTS, HANDLING FACILITIES, MACHINERY AND EQUIPMENT, BUILDINGS

FLEXIBILITY IS ONLY ONE OUTSTANDING FEATURE: Future expansion of any department can be accomplished without interruption to regular daily operations. Additional machinery and equipment can be installed . . . extra space provided . . . more production handled readily through increased facilities . . . ALL at minimum expense and without loss of time.

THIS BASIC DESIGN CAN BE USED ANYWHERE with only slight variations to meet any special limitations imposed by property sizes or irregularities of terrain. Whether you wish to erect a completely new plant or modernize an existing layout, KVS engineers can adapt this plan to meet your precise needs.

ALL BUILDINGS ARE DESIGNED TO HOLD CONSTRUCTION COSTS DOWN: As a result, a typical plant can be erected, following this basic design, at minimum cost. Room for future expansion has been provided and wall construction can be varied to suit climatic conditions anywhere without affecting the basic layout or efficiency of any department.

INCLUDED IN THE PLANT PLANS are provisions for the efficient use of primary and secondary crushers, limestone preparation, closed circuit grinding, screening, dewatering, burning, transportation and storage. In short, here are plans for a really **complete** plant which can be erected within limited areas and which is worthy of critical inspection.

A COMPLETE BULLETIN describing the function and placement of every piece of machinery and equipment in each department is available. In addition, the brochure gives a detailed explanation of the streamlined processes used in this scientific plant.

ANY CONCERN INTERESTED IN CONSTRUCTING OR REMODELLING a cement plant is invited to send for full information concerning this latest idea in modern cement production. Our brochure will tell you how and why such a plant is potentially the most efficient and profitable ever designed. It's further proof of the fact that "It Costs Less To Own The Best" when you specify KVS.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION
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A New Test Kiln for the Cement, Lime, Magnesite and Gypsum Industries

By DR. ALBERT O. H. LEONHARD

THE high standard figures of the tensil and compression strength tests, as well as the ever increasing demands of the consumers with regard to the quality of portland cement, and the different burned products of lime, magnesite and gypsum necessitate constant supervision and improvement of the production process.

If it is possible, therefore, to make comparison tests with a small test kiln under conditions like those in the big kilns, with regard to coal quality, coal consumption and final quality of the burned product, it will be of great help in the constant control of economical large-kiln operation in the improvement of their products.

For the production of a good portland cement, for example, it is very important to keep the best possible lime standard. The theoretical calculation of this lime standard, however, does not always give the best results in comparison with the practical results under the different working conditions of the big kilns. The changing chemical composition of the coal ashes, for example, has a great influence on the final clinker quality.

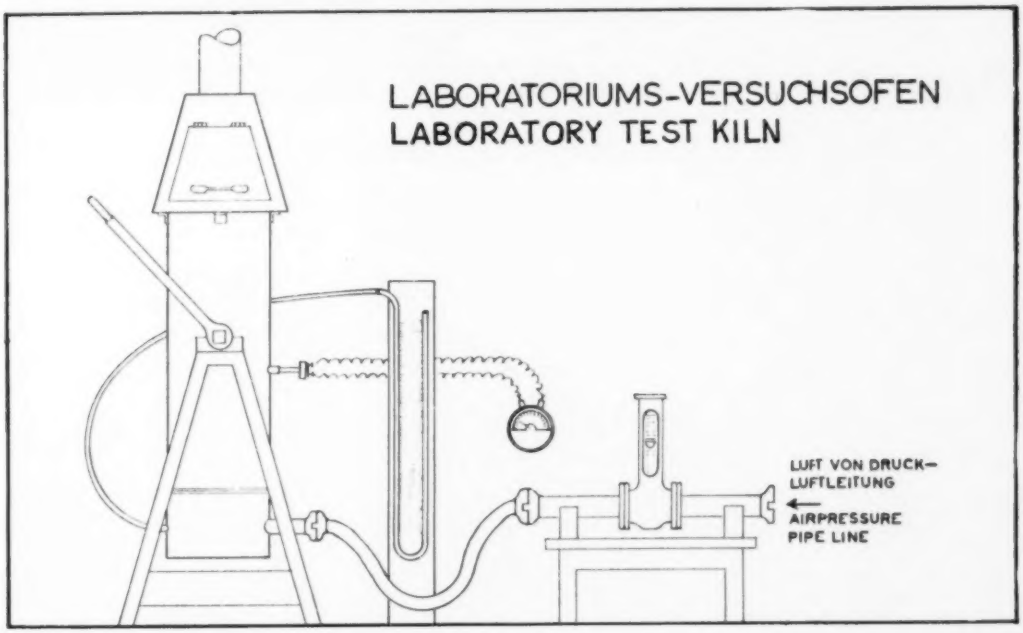
For plants using rotary kilns a small rotary test kiln with an oil-burner is already on the market, but it is expensive, takes quite a lot of space for its installation, and requires skilful handling. For shaft kiln plants, however, only very primitive test kilns have been used up to the present. These test kilns are built of brick, with an inner lining of firebrick. Natural draught (or a small blower) is used for the burning process. The raw material is to be formed into balls of about 2 in. in diameter by adding water. After drying, the balls are fed to the kiln mixed with about 30 percent of coke in small lumps of 1- to ½-in. diameter. The sintering of such a charge takes several hours, and the clinker produced contains mostly a high percentage of under- and over-burned parts, due to the unequal distribution of the coke, as well as of combustion air. In every case, such a burning test cannot be compared with the actual burning conditions within the big shaft kilns.

Test burning of portland cement —It may be of great interest, therefore for cement plants to make use of a small test kiln, capable of burning in less than one hour—and under the same conditions with regard to quality and consumption of coal as in the big kilns—a quantity of well burned clinker sufficient to prepare all standard tests, such as setting time, and tensile and compression strength a.s.o.

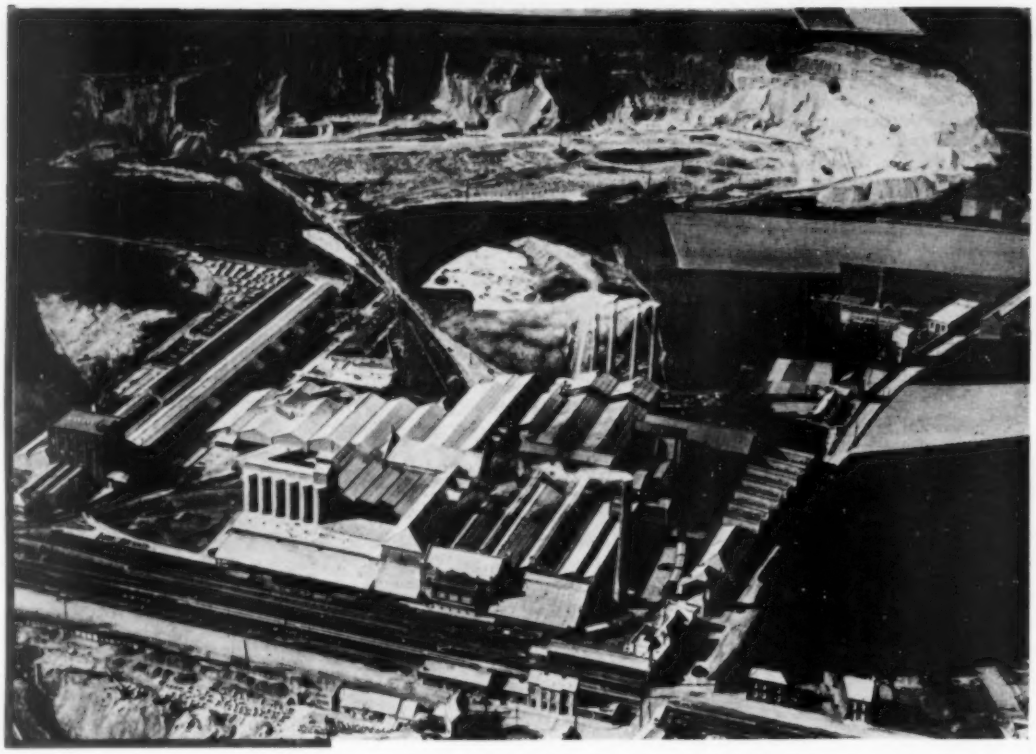
The new small test kiln, in combination with special machinery for forming small bodies of the raw material-coal mixture, is capable of burning within 20 to 45 minutes about 10 kilograms of clinker with a heat consumption of 1100 calories per kg. of clinker.

The quantity of air needed for the economical combustion of the coal or coke dust can be controlled by a measuring instrument, the sintering temperature by a thermo element, and the air resistance of the kiln by a "U" tube, showing the pressure in millimeters, water or mercury column. The air for the burning process can be taken from the com-

(*Continued on page* 24)



A World-Wide Review of the Portland Cement Industry



An aerial view of the plant and quarry of C. P. Artificiels Belges D'Harmignies at Harmignies, Belgium. An extensive modernization program is now under way at this plant.

JUDGING from the fragmentary information now available, the cement industry throughout the world has made great strides since the end of World War II. Literally dozens of new plants have been built in all parts of the world in these few years, or are under construction, and many more are in various stages of planning. Many plants have never been reopened since the war, due to war damage, obsolescence, etc. but there is no doubt that the world capacity of the cement industry is now far in excess of what it was before the war.

There is a large and growing backlog of demand for new construction in most countries and in others it will take many years to rebuild war-devastated areas. Hitherto undeveloped countries are entering the picture also, and many of the new cement plants are necessary parts of their industrialization programs. There are also plants being built or planned in countries which had previously imported their cement needs.

The late war resulted in considerable direct damage to cement plants, particularly in France, Belgium, The Netherlands, Germany, Italy, Great Britain, Austria, Russia, Japan and China. Perhaps even more important, however, was the indirect effect of the war on plants in other countries which were unable to get necessary new equipment, replacement parts, and supplies for the duration, but had to continue in operation as best they could. Some of the many new and improved plants and others of importance are described in this series of articles, together with the latest information on general conditions in the cement industry in each country.

PART I—EUROPE

AUSTRIA

Both the production and the demand for cement increased sharply in 1949 over 1948. Total cement production reached an all-time high of 1,091,012 metric tons, as compared with 721,379 tons in 1948, 281,271 tons in 1947, and 429,000 tons in 1937. Most of this was reported used for reconstruction of war-devastated areas. Practically all of the 1949 production was portland cement, and it represented about 83 percent of capacity. Nine of the 11 plants in operation produced portland cement only; one produced

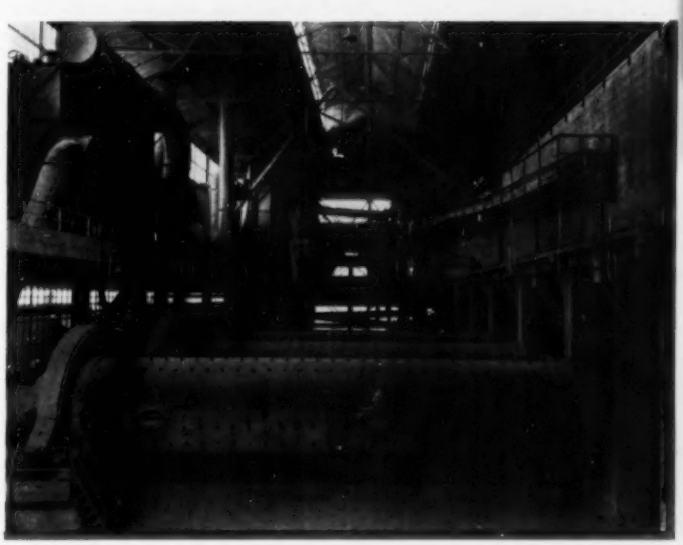
Air view of the plant and quarry of S. A. Ciments D'Obourg at Obourg, Belgium, where an extensive postwar expansion program has just been completed.

New plants and important expansions are widespread as demand in many countries exceeds capacity

iron-ore cement; and another, portland cement and blast furnace-slag cement. Small quantities of slag cement were also produced by a steel company (Huette Linz) by a combination process. In 1943 there were 15 plants in Austria with a total capacity of 1,200,000 tons.

Some cement had to be exported to obtain needed machinery and repair parts. This practice may continue in 1950 because of lack of foreign exchange. Some shipments are being made in special bulk cement cars. The power consumption of these plants varies widely with the degree of mechanization. Average coal requirements for a metric ton of cement are 1000 to 1200 kw.-hrs. Average coal requirements are 30 to $33\frac{1}{3}$ percent in weight of clinker produced

Perlmoser Zementwerke By far the largest plant in Austria is that of Perlmoser Zementwerke of Vienna at Manners-



The three 50-t.p.h. finish-grinding mills in the D'Obourg plant, with air separators in the background and dust collectors at the left.

dorf, Lower Austria, with a capacity of 22,000 tons monthly. This company, with its five plants, has a monthly capacity of 50,300 tons, nearly half the 110,000-ton capacity of the industry.

BELGIUM

The cement industry in Belgium made substantial progress in 1947. The output was 2,609,092 metric tons, as compared with 1,889,777 tons in 1946. Exports totaled 1,078,-151 tons. The five producing companies had 38 kilns in operation at the end of the year. It is also reported that production in the first half of 1948 was 1,680,000 tons, a considerable increase over the first half of 1947.

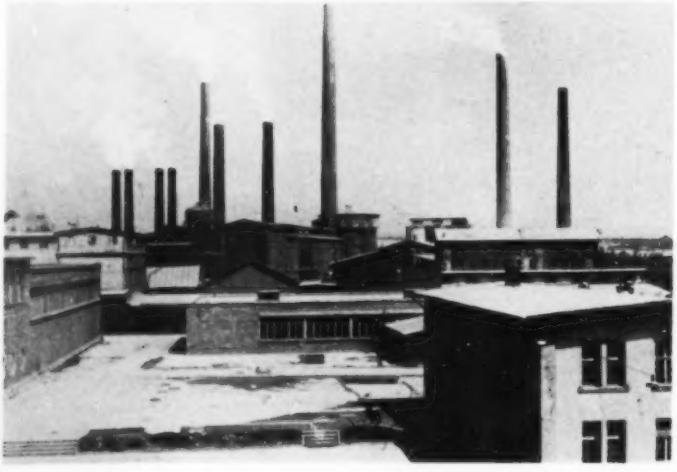
D'Harmignies The firm of Ciments Portland Artificiels Belges D'Harmignies, Brussels, Belgium, recently celebrated its 50th anniversary. To commemorate the occasion the firm published an illustrated booklet describing and illustrating the plant at Harmignie and giving much pertinent information on the company and its products. It is evident from the information at hand and the evidence in the illustrations that this company is in every way keeping up with progress in the industry.

The company was formed on July 22, 1899, as Societe Anonyme des Ciments Portland D'Harmignies. Its first plant produced what was then known as artificial portland cement by the dry process, using as raw material a remarkable pure chalk deposit. On August 7, 1907, this company merged with S. A. des Ciments Portlands Artificials Belges. The purity of the deposit in 1910 induced the company to enter the manufacture of molded and washed chalks. In 1912-13 the cement plant was completely remodeled and the use of the dry process in straight furnaces was discontinued. The new equipment installed included two 110-ton capacity rotary kilns, as well as diluters, slurry vats, and other equipment required by the wet process.

When Belgium was occupied in the first world war, the owners refused to supply the enemy with cement, and the plants were taken over for about three years. In withdrawing, the enemy took part of the equipment; but this was recovered, and the plant was back in operation late in 1919. In 1920 the production of chalk was greatly increased, and two new rotary cement kilns and related equipment were installed. On March 9, 1921, the company assumed its present name and late in that year two more rotary kilns were installed. Later the manufacture of asbestos-cement products was begun, and in 1933 white cement was added.

Today the company has a capacity of 150,000 tons (metric) of grey cement which will meet all specifications including the U.S., and white cement; 90,000 tons of molded and washed chalks; and 4,000,000 square meters of asbestos-cement sheets. At present the company is working on a vast program of modernization of all its operations which will cost some tens of millions of francs.

The plant of S. A. des Ciments de Thieu at La Louviere, Belgium, where metallurgical cements are produced.



The Amöneburg (Germany) plant of the Dyckerhoff Portland-Zement Werke.

D'Obourg Along with other manufacturers of cement in Belgium no improvements were made to the plant of S.A. Ciments D'Obourg at Obourg, Belgium, during the occupation. As soon as the war was over, however, work was begun. This company has completed a program which brought its capacity up to 4,000,000 bbls. annualy, making it one of the largest plants in Europe, if not in the world.

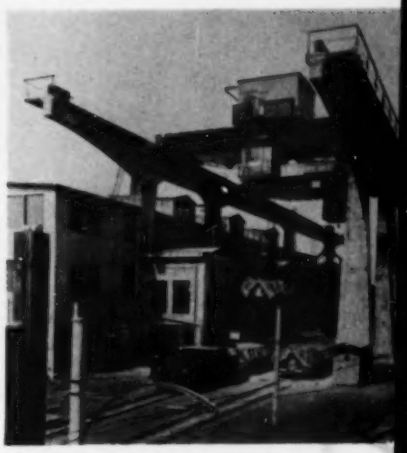
The deposit is a very pure chalk; and bulldozers, scrapers and shovels are used in the quarry. LeTourneau 15-ton trailers take the chalk to the crushers and it then goes to the diluters by means of cable cars. The mixing of the slurry is very simple compared with U.S. practice, as the chalk is very pure and contains no MgO. Mixing is done in a huge 240,-000 cu. ft. homogenization tank in which the slurry is kept moving by mechanical agitators. There are six

The portland cement industry ranks as one of the most important in the United States of America and in other countries throughout the world, not only because it supplies a basic construction material without which there could probably have been no industrial age and few important structures could have been built, but also because in tonnage, value of production, power requirement, etc., it is excelled by only a few other industries.

It is because of this fundamental importance of portland cement to our civilization that we have often wondered why so little is known about the extent of this industry throughout the world. Over a period of years all possible sources of information have been sounded out; but nowhere were we able to find more than fragmentary information. We, therefore, compiled a list of cement companies and plants from our own sources of information which we believe is the most complete list now in existence. We wrote to every known cement company in the world, asking for details on their own operations and general information on the conditions in each particular area or country, intending to condense and coordinate this information in an article in this issue.

The number of replies exceeded our expectations, with the result that we will have to present this article in several installments, the first one, in this issue, dealing with about half the cement-producing countries in Europe. Information on the remaining European countries will appear in a later issue, followed by those in other parts of the world.

We frankly admit that even the huge volume of information we have been able to obtain presents only a partial picture, but we believe it will add much valuable information to present knowledge. In order to make succeeding installments even more nearly complete than this first one, we ask producers in all parts of the world and others having such information to send us brief information on their own companies and plants, a list of other plants in their areas and any important recent developments among these plants, and some general information on the conditions in the industry in their countries. A photograph or two of each operation will be accepted with gratitude and will be published.—The Editor.



The overhead traveling crane used for handling raw materials at the Amöneburg plant.

rotary kilns, three of them 300 ft. long, and all are equipped with electro-filetrs to remove the stack dust. The storage has a capacity of 25,000 metric tons of clinker.

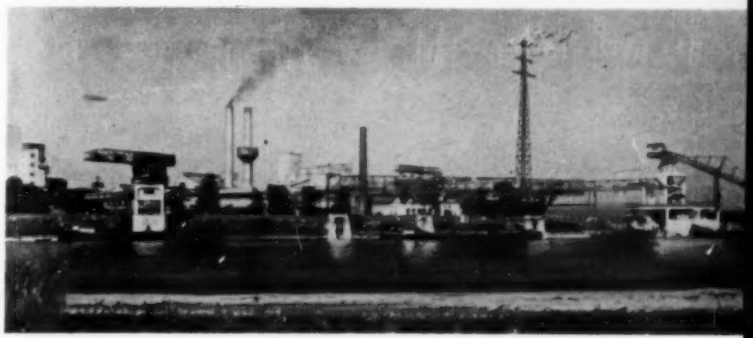
The clinker is ground cold in two milling stations utilizing a total of 7,000 hp. The latest one of these is a closed circuit operation and consists of a preliminary mill with a capacity of 150 tons per hr. and three 50-ton finishing mills connected to Sturtevent air separators. As a result, the company's standard portland cement is said to meet the strength tests for high-early-strength cement. For further blending the finished cement is withdrawn from several silos simultaneously. Several Fluxo bagging machines which can pack 15,000 bbls. daily are used.

The company is very proud of the fact that its product will meet the specifications of any other country, including the U.S., and it ships to a world-wide market. It is said to have been the first cement company in Belgium to resume exports to the United States after the last war.

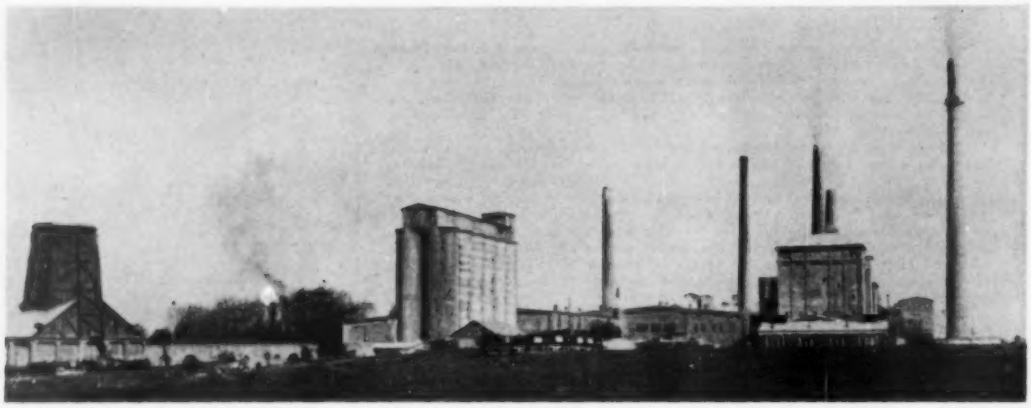
Cementeries et Briqueteries Reunies The firm of Cimenteries et Briqueteries Reunies S.A., with offices in Brussels, has for many years operated seven cement plants in that country. Six of these are now being dismantled, only the Mons plant, with a capacity of 400,000 metric tons annually, being retained. To replace the other plants an entirely new and modern 400,000-ton plant is being built at Lixhe. This is scheduled to go in operation about September 1, 1950. Most of the equipment for this plant is of Allis-Chalmers manufacture. Included are two 11½- by 475-ft. kilns, each with a rated capacity of 500 metric tons of clinker per day. It is reported that $1,535,000 for the building of this plant is being provided through the E.C.A.

Ciments de Thieu The Societe Anonyme des Ciments de Thieu established a plant near Brussels in 1921 for the manufacture of standard portland cement. It has since added the entire range of cements, including high-resistance and quick-hardening. In 1933 a second plant was built at La Louviere for the manufacture of metallurgical cements. After considerable research a supersulphated metallurgical cement "Sealithor" was developed which has high compressive and tensile strengths and has high resistance to chemical attack. It is finding a growing market for various construction and special uses. Little is known about production methods, but it is known that small quantities of artificial cement (generally less than 1 percent) and some calcium sulphate are added to basic graunlated blast furnace slag in such proportions that the mixture contains at least 7 percent of sulphuric anhydride. It is also reported that less fuel is required in its manufacture, about 45 kgs. per metric ton.

The portland cement plant is supplied with chalk and clay from deposits nearby. Thorough mixing and blending of the raw materials to obtain the desired composition is achieved through the use of mixers, grinding rollers and tanks. There are four Polysius 2½- by 60-meter Solo kilns. Four tube mills produce 600 tons of cement daily, and the



Facilities for water receipt of raw materials and for shipment at Dyckerhoff's Neuwied plant.



Mark II dry-process plant, one of two operated by Dyckerhoff at Neubecken, Westphalia.

plant is rated at 120,000 tons annually. A Fluxo packer with 12 outlets is used, and bulk shipments are also made. Since 1945 the manufacture of all portland cements has been adjusted to the U.S. requirements for stability to the autoclave test.

WESTERN GERMANY

Due to the revival in construction, the output of the cement industry in western Germany showed considerable increase late in 1949. Nearly all plants were back in operation, with an annual capacity of 13,000,000 metric tons, about the same as in 1938, and with about 80 percent of that capacity being utilized.

Of the 60 cement plants in the British zone, most of them in Westphalia and Hannover, all but nine were granted permits to resume production in the summer of 1945. During 1946 production reached a total of 1,300,000 metric tons, about 20 percent of prewar capacity. Many of these plants were severely damaged during the war and others were too obsolete for economical operation. It was thought then that about half the plants might be dismantled, for the above reasons and because of the British plan for reducing capacity.

According to figures dated late in 1943 Greater Germany (including various annexed territories) in that year had 165 cement plants, with a combined capacity of 25,500,000 tons. Of these, 129 were in the Old Reich (including Sudetenland) and had a combined capacity of 20,380,000 tons.

Dyckerhoff One of the pioneer producers of portland cement in Europe, and one of the largest, is the Dyckerhoff Portland-Zementwerke A.G., with offices at the main plant at Wiesbaden-Amöneburg and other plants at Neuwied, and at Neubeckum and Lengerich in Westphalia.

Amöneburg plant — The Amöneburg plant of the Dyckerhoff Portland-Zement Werke at Wiesbaden-Amöneburg on the Rhine was founded in 1864 and has grown until it now has nine rotary kilns. It has been modernized continuously and has been the scene of considerable pioneer work in cement production and technology. It is a wet process plant and is supplied from a deposit nearby which needs no additions. In addition to producing the normal cements Z. 225, Z. 325, and Z. 425, the plant is also the only one in Germany making white cement.

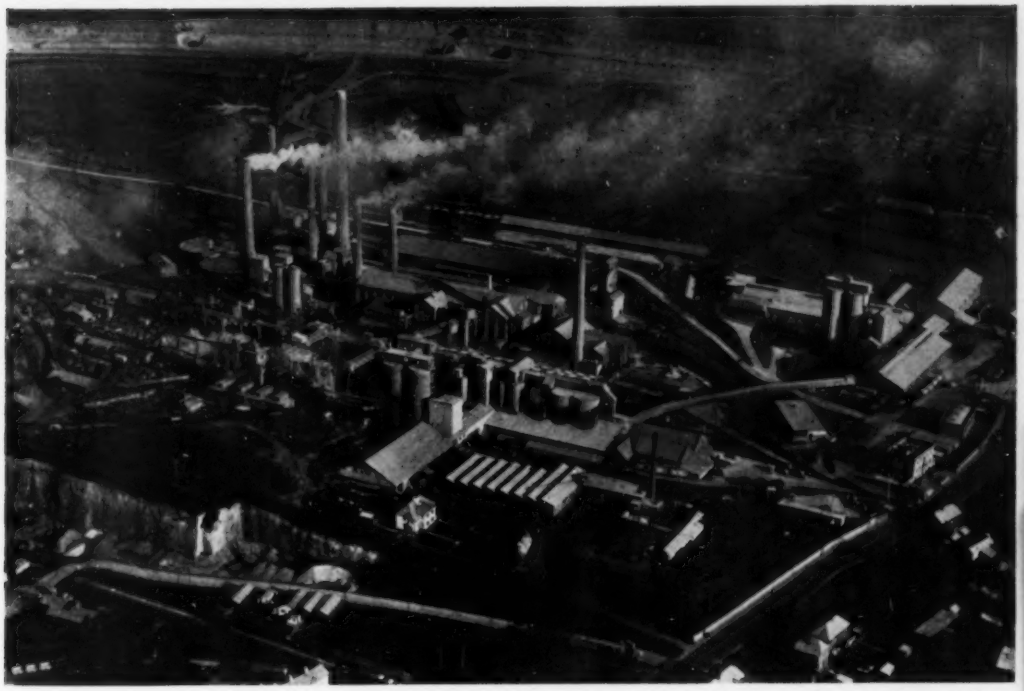
In the quarry three crawler shovels are used for removing overburden and five for loading rock, making it possible to get an excellent preliminary blend by quarrying selectively. In 1949 a new stripper was obtained from the Lubecker Maschinenbaugesellschaft, Lubeck, which has a capacity of 200 cu. m. per hr. The stone is hauled to the plant in side-dump cars.

The three Titan crushers have a capacity of 250 metric tons per hr. each, and their product is carried on steel belt conveyors to the 15 preliminary raw grinding ball mills which are each 2.5- by 2.0-m. Final grinding of the slurry is done in 17 two-compartment mills. An unusual feature is the use of 42 slurry silos of 250-cu. m. capacity each, which make possible very accurate blending into the 5000-cu. m. capacity kiln feed silo. This silo has air agitation; another is now being built which has a capacity of 2,000 cu. m. and is equipped with a Dorr mixer. Facilities for production of slurry are also being increased.

There are seven 3- by 50-m. rotary kilns and one 3.3- by 70-m. for the production of grey cement, all equipped with slurry spraying and electric dust removal. Another kiln is used for the manufacture of white cement. Firing can be done with either coal or oil. The fuel is received by water, and coal grinding is done in a central grinding installation which is now being enlarged and remodeled.

The cement is ground in tube mills without sifters, the complete installation (capacity, 175 tons per hr.) consisting of several closed mill

The No. 1 wet-process plant of Dyckerhoff at Lengerich, Westphalia.



The West Thurrock (England) plant of Tunnel Portland Cement Co., Ltd., said to be the largest plant in Europe.

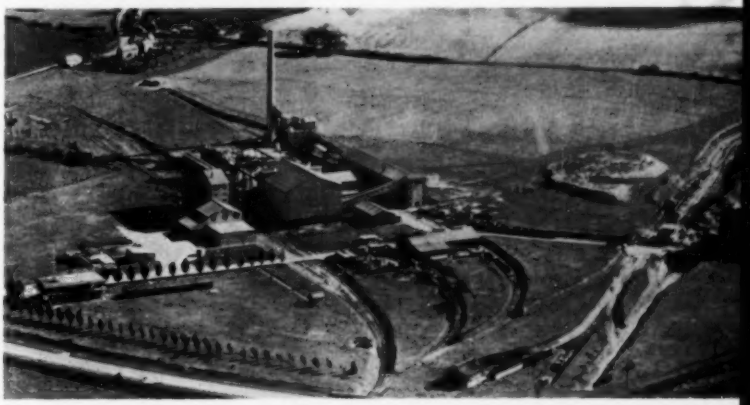
groups. The newest of these groups is being expanded with the addition of 2.4- by 14-m. two-compartment mills. Cement is shipped in bulk and in sacks by rail, trucks, and water. A distributing plant at Frankfort on the Main is supplied by water, and cement is distributed from it in special bulk cars. The main plant has 11 packers, most of them St. Regis. Power for the main plant is supplied from its own steam plant which has a capacity of 23,000 kv.-a.

Neuwied plant — The Neuwied plant of the Dyckerhoff Portland-Zement Werke at Neuwied on the Rhine was built as a completely new two-kiln operation in 1929-31. It was modernized in 1937-39. It is located on the Rhine River, and most of its output is used by the pumice industry in the Neuwied basin. In addition to Z. 225 and iron portland cements, it makes a standard binding agent for this industry. Unlike most German plants, it is located as close as possible to its chief market, and raw material is shipped in a considerable distance by water.

Crushing is done at the quarry and raw grinding at the plant is done in three 2.2-by 14-m. compartment mills. Here also numerous slurry silos are used for accurate blending. The kilns are equipped with spraying and electric dust collectors and are coal fired. Attached drum coolers are so efficient that the clinker can be carried away on rubber belt conveyors. The central coal grinding plant has a dryer and a compound mill, and will soon be enlarged. The clinker is ground in three 2.2- by 14-m. compound mills located in the same building as the raw mills. Packing of the cement is done by three Andreas baggers with an hourly capacity of 30 tons each. Much of the cement is shipped in bulk in cars and trucks, and there is a large mechanical installation for loading boats. All power for this plant is purchased.

Mark plant—The Mark operation of the Dyckerhoff Portland-Zement Werke at Neubeckum, Westphalia, consists of two plants which were built on the sites of older operations in 1911-13. Both have been considerably improved from time to time since. Plant Mark I has two rotary kilns and Mark II has three kilns. Both produce Z. 225 and Z. 325 cements.

Both plants are dry-process operations and secure their raw material



Tunnel's Pitstone plant, a 1-kiln operation to which a second complete unit is now being added.

The plant of Ribblesdale Cement, Ltd., a Tunnel subsidiary, at Ribblesdale. A third kiln is being installed here.

by means of four power shovels and a steam railroad in a common quarry. Some high-calcium limestone is shipped in for adjusting the mix. Both plants have Titan crushers and rotary driers. Plant I has compound mills and Plant II has compound mills with sifters. The finished raw material is blended mechanically.

Plant I has 2.3- by 2.8- by 60-m. Polysius kilns; Plant II has two 2.8- by 50-m. Miag kilns and a 3.0- by 50-m. Klöckner kiln. All kilns are normaly fired with coal, but Plant II is also equipped for oil firing. Both have central coal grinding and drying plants. In both plants clinker grinding is done in compound mils, and Andreas and Haver-Boecker packers are used. Bulk and sacked cements are both shipped from the plant in cars and trucks but some is also trans-shipped via the Dortmund-Ems Canal from the nearby port of Hamm. The electric power for Plant I is supplied from a waste-heat power plant; that for Plant II is purchased.

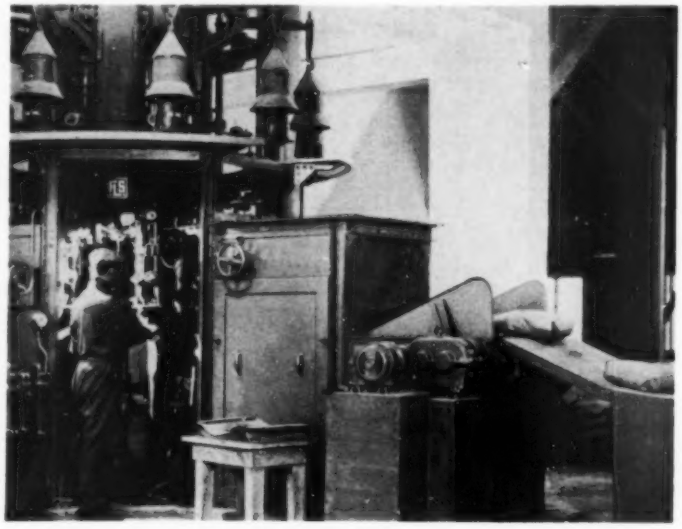
Lengerich plants — At Lengerich, Westphalia, the Dyckerhoff Portland-Zement Werke operates two cement plants and several smaller lime plants. These plants are adjacent and were supplied from separate but adjacent quarries which are now being combined into one. Plant I is a wet-process operation with three rotary kilns; Plant II is an older operation with eight shaft kilns. Z. 225, Z. 325 and Z. 425 cements are made, as well as a special oil-well cement and iron portland cement.

Two shovels and three draglines are used in the quarry, and the stone is brought to the plants by a steam railroad. Both plants have Titan crushers. In Plant I the slurry is reduced in a preliminary mill, two secondary mills, and three compound mills. This mixing of the slurry is done in numerous small tanks, and a 2,000-cu. m. tank with a Dorr mixer was recently added for even more accurate blending. The three 3- by 50-m rotary kilns are equipped with sprays and electric dust collectors, and are coal fired. The original central coal proceessing plant was replaced in 1949 by four individual grinding-drying mills for direct or semi-indirect firing. In order to obtain data for future guidance, two Fuller mills and two Buttner ball mills were installed. The cement grinding installation consists of three Miag sifting mills and two compound mills. This department is now being expanded by the addition of a new 2.4- by 14-m. compound mill. Two packers, an Andreas and a Haver-Boecker, are used. Shipments are made via rail or truck, and water shipments are made via a railroad spur from the canal port of Saerbeck.

In the Lengerich Plant II the raw material is dried, ground in tube mills, and mixed mechanically. It is then briquetted and fed to the eight 2.5- by 8-m. shaft kilns. Clinker grinding is done in tube mills and packing in Haver-Boecker packers. Most of the cement is shipped in sacks via railroad and truck. Power for both plants is purchased.

Portland-Zementwerke Heidelberg The Portland-Zementwerke Heidelberg, A. G., Heidelberg, Germany, is one of the largest producers of nonmetallic minerals on the Continent, operating eight cement plants, two gypsum plants, two concrete plants, and others. None of the cement plants are new, but all have been kept up with modern practice. Their combined capacity is 1,750,000 metric tons annually. Special attention is given at all of the plants to the comfort and entertainment of the employees. The plants have all modern facilities and in addition have canteens, libraries, reading rooms, meeting rooms, etc. The company provides homes for its employees at all plants and the Leimen plant has a swimming pool.

Leimen plant—The Leimen plant operated by Portland-Zementwerke Heidelberg, A. G., is its largest operation, having a capacity of 360,000 metric tons annually. In 1873 a plant was built in Heidelberg and in 1897 this was replaced by the plant at Leimen, which has since been considerably enlarged and im-



A typical installation of a bag packer used in all the Tunnel plants.

The slurry preheater on a welded kiln at Tunnel's West Thurrock plant (left).

The grinding mill of the type being installed at Tunnel plants has slide-shoe bearings (right).

proved. Z. 225, Z. 235 and trass cements are produced.

The stone is transported from the quarry to the plant by a 6-km. cableway. The rock is dried in rotary waste-heat driers and after crushing is redried. Raw grinding is done by 50 Bradley Griffin mills. There are 17 rotary kilns of various sizes which are fired with coal ground in Griffin mills and an air-swept mill. Clinker grinding is done in four mills (Miag, Krupp and Polysius) and the cement is conveyed to storage pneumatically. Packing is done by seven St. Regis and two Haver-Boecker packers. A waste-heat power plant installed in 1904 supplies 70 percent of the power required by this operation.

Weisenau plant — The Weisenau plant has a capacity of 300,000 metric tons annually and produces Z. 225, Z. 325 and Z. 425 cements. This plant was built in 1864 but was taken over by the company in 1887. Wet process rotary kilns were installed in 1907.

The raw material is hauled to the plant by a diesel locomotive and is reduced by two Miag Titan crushers, two 2-compartment Miag preliminary mills, and six Loehnert and Andreas 3-compartment finishing mills. The slurry is blended in eight tanks equipped with air agitation. There are three Miag 3.4- by 53-m. rotary kilns equipped with Calcinators for preheating, and the kiln discharge gas temperature is about 100 deg. C. Clinker grinding is done by three Polysius 3-compartment mills, and the cement is transported pneumatically and mechanically to storage. There are four automatic bag packers. Shipments are made by rail, truck, and water.

Nurtingen plant—The plant at Nurtingen, Wurttemberg, was built in 1898 and was taken over by Heidelberg in 1900. The limestone is crushed at the quarry and is carried 2 km. by an aerial tramway to a loading point, from which it is hauled 10 km. by rail to the plant. In this plant also the stone is passed through waste-heat driers before going to three raw-grinding mills. There are five rotary kilns and one shaft kiln, all coal fired. Clinker is ground in three mills, and there are four bag packers. The dust-collecting system at this plant is unusually efficient; the original spray towers have been supplemented with electrical precipitation. This plant has an annual capacity of 220,000 tons of Z. 225 and Z. 325 cements.

Schelklingen plant—The plant at Schelklingen, Wurttemberg, was built in 1900 and was taken over by Heidelberg in 1918. In 1925 it was completely rebuilt. It has a capacity of 210,000 tons annually and produces all three types of standard portland cement. The stone is hauled 4 km. to the plant by an electric railroad and is dried there in waste-heat driers. It is crushed before going to the 16 Griffin mills after which it is again dried. There are two rotary and two shaft kilns. The rotaries are fired with coal from direct-firing pulverizers. The clinker is ground in 3-compartment mills, and there are three bag packers. Mechanical and electrical dust collectors are used.

Blaubeuren plant—The plant at Blaubeuren (Portland-Cementfabrik Blaubeuren Gebr. Spohn A.G.) was originally built in 1870, but was rebuilt and enlarged in 1910, 1918, 1934, and 1941. It was taken over by Heidelberg in 1938. It has an annual capacity of 270,000 tons of Z. 225 and Z. 325 cements and lime.

The stone is hauled from the quarry by an electric railroad. It is dried in vertical driers before going to the crusher and is then ground in two drying and grinding mills. All calcining of lime and cement is done by five C. v. Grueber automatic shaft kilns with a capacity of 150-60 tons daily each. They are mixed-feed fired with coal. Clinker grinding is done in three Krupp Centra mills, and there is silo storage for 20,000 tons of finished products.

Lengfurt plant — The plant at Lengfurt am Main was built in 1898 and was taken over by the company in 1922. It has a capacity of 180,000 tons annually and makes the same products as the Blaubeuren plant.

The limestone is hauled to the plant by diesel locomotives and cars. There it passes through waste-heat rotary driers before going to the crusher and then through additional driers before being taken to the two 3-compartment raw mills. The three rotary kilns are coal fired and have waste-heat boilers. Clinker is ground in two 3-compartment mills. There are four bag packers. Shipments are made by rail, truck, and water.

Burglengenfeld plant—This plant, built in 1912, is known as the Portland-Zementwerk Burglengenfeld A.G. It has a capacity of 220,000 metric tons annually and produces Z. 225 and Z. 325 portland cements and Z. 225 iron portland cement.

The limestone is hauled 2 km. by diesel locomotives to a cableway which takes it to the plant. The stone goes through rotary driers ahead of the crusher and then to three 2- by 20-m. rotary driers before being fed to the two 3-compartment raw mills. The three kilns are coal fired. They include a 3.2- by 34-m. Lepol kiln with a capacity of 300 tons daily, a 2.3- by 58-m. Polysius Solo kiln of 150-ton capacity, and a 150-ton Rodberg 2.6- by 50-m. rotary kiln. Clinker is ground in two 3-compartment mills. Electrical dust precipitation is employed.

Kiefersfelden plant—The plant at Kiefersfelden in Upper Bavaria was

built in 1922 and is operated as Bayerisches Portlandzementwerk Kiefersfelden A.G. It has a capacity of 210,000 tons annually and makes Z. 225 and Z. 325 cements and lime. The clay and shale are hauled 4 km. to the plant by diesel locomotives. They are then dried and ground in tube mills before going to the four shaft kilns. These are 7- by 2.5-m. kilns with forced draft and are mixed-feed fired with pulverized coal or coke. Each kiln has a capacity of 150-60 tons daily. Clinker is ground in 3-compartment mills.

GREECE

In 1946 the Greek government requisitioned all the cement plants in Greece in order to exercise the control necessary to promote a new reconstruction plan. Production in 1947 was 176,673 metric tons.

General Cement Co. The General Cement Co., S. A., of Athens operates two cement plants—Heraklis at Piraeus, and Olympus at Volos—which in 1947 represented nearly half the capacity of the industry in that country. Their combined production in 1947 was 65,453 metric tons. Two 11- by 400-ft. F. L. Smidth dry-process rotary kilns were recently shipped from the United States for the Piraeus plant under the ECA rehabilitation program. These should be in operation by the end of 1950.

UNITED KINGDOM

In the United Kingdom (England, Scotland, Ireland, and Wales) the production of portland cement in 1948 was a record 8,521,543 long tons, exceeding the previous record of 8,212,366 tons made in 1939. Many plants were still shut down and others were being reconditioned. The output of the industry was expected to reach 9,000,000 tons in 1949. During 1949 about 20 percent of the output of the industry was exported to meet government commitments for overseas development schemes. In 1948 the industry exported 1,628,200 tons of portland cement and also some white and colored cements. The 1949 export goal was 2,000,000 tons.

Early in 1950 it was reported that £11,500,000 was in process of being spent to increase the capacity of the industry by 1,350,000 tons a year. The only holdup was in the delay of getting necessary raw materials, permits, and dollars.

When the question of nationalization of the cement industry was raised, the Cement Makers Federation, which includes nine competing companies owning 45 plants, called attention to the fact that the price of cement had advanced only 53 percent over prewar, in spite of an increase of 145 percent in the cost of nationalized coal. Unlike many industries, the cement makers of the United Kingdom do not have to import raw materials from dollar countries.

Associated Portland Cement Mfrs., Ltd. Associated Portland Cement Manufacturers Ltd., London, England, is one of the great English cement producing companies. It was founded in 1900 through the amalgamation of many cement companies. With its subsidiary companies, the largest of which is British Portland Cement Manufacturers, Ltd., it now has a capacity in England alone of over 6,000,000 bbls. per year, and in addition produces large quantities of lime, whiting, and other materials. It is in every sense an international concern, having large cement manufacturing interests in India, South Africa, Canada, and Mexico. Additional plants have been added or are contemplated for other countries.

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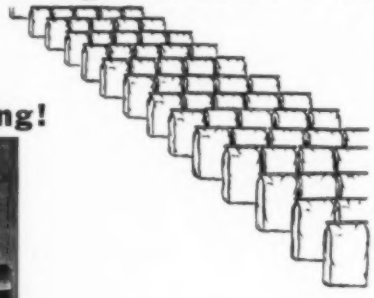

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Tunnel Portland Cement Company, Ltd. The Tunnel Portland Cement Company Ltd., London, England, is the second-largest group of cement manufacturers in Great Britain, owning cement plants located at West Thurrock, Essex, and Pitstone, Buckinghamshire. Three plants have been enlarged recently. It has recently completed the first new postwar plant in that country at Padeswood in North Wales. The company also has a 50 percent interest in Ribblesdale Cement, Ltd., in Lancashire and is interested in plants in Eire, Egypt, and other places.

West Thurrock plant—The West Thurock plant is said to be the largest in Europe. It has seven large Smidth Unax kilns with a combined capacity of 5½ million barrels annually. The newest kiln was built after the war and is of all-welded construction with a Smidth slurry preheater and a Smidth Folax grate cooler with a stationary horizontal grate. Kiln gases leave the preheater at a temperature of only 300 deg. F., corresponding to a fuel rate of only 2,500 B.t.u.'s per lb. of clinker for a slurry with a 40 percent moisture content. The raw material at this plant is so soft that it can be loaded by electric shovels without blasting.

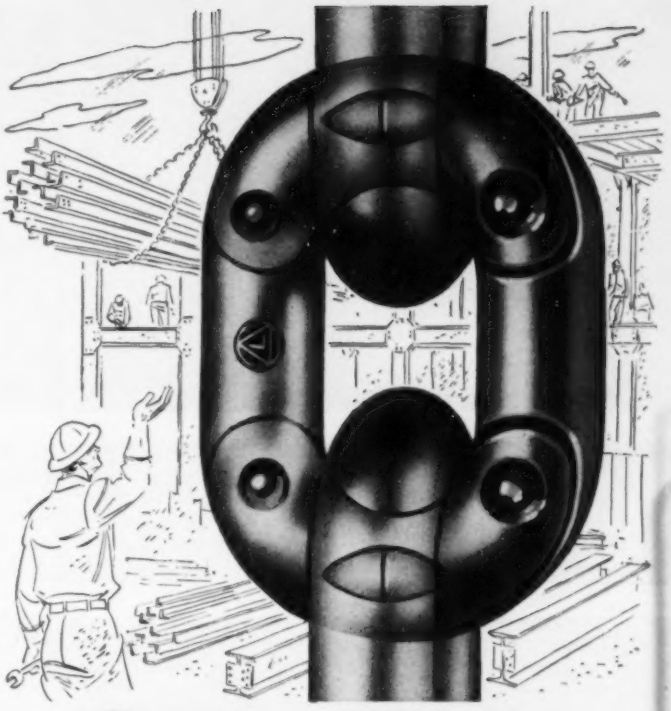
The grinding plant is also modern, with large Unidan mills supported on slide shoe bearings and driven through Symetro gears. The four newest clinker mills range in size from 900 to 1,650 hp. and have a combined capacity of 750 bbls. per hr. Packing is done with four Smidth Fluxo packers. A single operator with one of these packers can pack 600 bbls. per hour.

Pitstone plant—The Pitstone plant of Tunnel Portland Cement Company, Ltd., was built as a compact single-unit operation with ample space for extensions. The second unit is now being added to this plant and includes a kiln identical to the latest one at West Thurrock, with a Smidth slurry preheater and Folax cooler.

The raw material is a soft marl with a calcium carbonate content of from 65 to 85 percent. The stone from various parts of the quarry can be readily blended to get the desired slurry composition. The Smidth Unidan clinker mill has a 900-hp. Symetro gear drive and has a capacity of 120 bbls. per hr. A Smidth Fluxo packer is used. Much of the output is shipped in bulk in trucks.

Ribblesdale plant — The Ribblesdale cement plant has two kilns with

(*Continued on page* 123)



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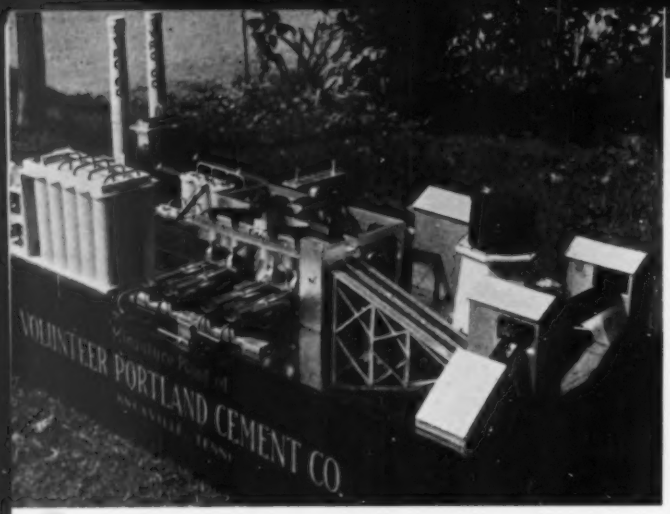


New Kiln at Volunteer Plant

another ON THE SPOT report

IN a determined effort to meet the upsurge of demand for portland cement in the busy industrial area which it serves, the Volunteer Portland Cement Company of Knoxville, Tenn., has undertaken an expansion program which is expected to bring about a 60 percent increase in the output of portland and masonry cements. Installation of a new 10- by 300-ft. Vulcan rotary kiln, as well as additional raw grinding equipment and slurry tanks, is now well advanced, and it seems probable that the new facilities will go into production some time late this year.

The new wet-process kiln will supplement the production of the two 10- by 315-ft. Vulcan units which were installed in 1928, when the plant was built. It is expected to produce 2,100 bbls. per day, as compared with 1,620 bbls. per day for each of the older units, giving the plant an annual output, with all three kilns in operation, of approximately 1,920,000 bbls. There is every assurance that the increased output will be readily absorbed by the thriving area of which Knoxville is the commercial center.

All of the construction work on the Knoxville plant addition is being handled by the Crosby Construc-

This aerial view shows the location of Volunteer's plant relative to the two quarries which supply the mill with raw stone.

Opposite page, left: An animated model of the plant was made several years ago for exhibit purposes. It shows with considerable accuracy the relationship between the various departments of the mill.

Opposite page, right: E. E. Calloway, plant superintendent; J. A. Bozman, assistant to superintendent; Charles F. Lewis, general manager; and T. Hagstram, erection engineer for F. L. Smidth.

Right: Rolling one of the 100-ft. sections of the new 10- by 300-ft. rotary kiln onto cribbing alongside the concrete piers.

Will Up Capacity 60 Percent

By WILLIAM M. AVERY

tion Company of Chicago, and the project is proceeding on schedule despite the extremely adverse foundation conditions which have been encountered. Concrete is being batched and mixed with a portable plant located on the job site.

Quarry Raw stone for the Volunteer mill comes from two open quarries located about a quarter of a mile from the plant. The deposits are far from ideal from an operating point of view, for much of the rock is pitched at 45 to 90 degrees, and overburden ranges up to 30 ft. in depth. Stripping is rendered difficult by the presence of many clay pockets, particularly in the upper levels.

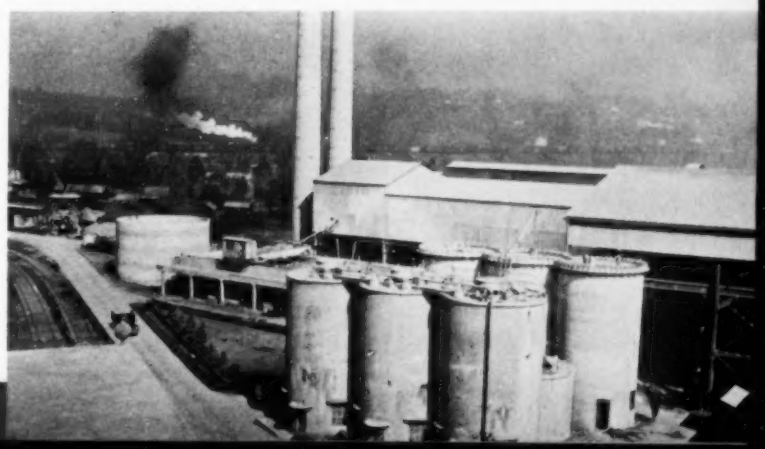
Last year, as an initial step in increasing quarry output to keep pace with mill demands, the company put down some 8,500 ft. of core holes, proving up quite large, accessible reserves of limestone and marble. As a result of information thus obtained, the present plan is to concentrate on an area of about 24 acres, including one of the present quarries, where the test drillings showed over 5,000,000 tons of stone above the water level of the nearby Holston River. This area is covered by fairly heavy overburden which it is planned to remove by dragline and shovel down to the general surface of the rock. Additional overburden located in pockets will be removed hydraulically. There is room close by to dispose of this overburden at reasonable cost.

Since the test drilling showed good rock well below river level, the company plans later to locate and grout all water channels in the area leading to the river in order eventually to be able to recover the deeper stone.

Wall drilling is done with Sullivan jackhammers, and four wagon drills of the same make are employed for toe and vertical drilling. Benching is extremely difficult due to the pitch and heave of the rock, and drilling patterns must be freely improvised from week to week in accordance with existing conditions and past experience.

From 100 to 200 holes are fired at a time, using Du Pont delay caps in the wall shots. Even with this procedure a good deal of secondary blasting is required, company estimates indicating that about 30 percent of the total tonnage requires secondary reduction in the quarry. Drilling rates average from 23½ ft. per hour with the wagon units to 13 ft. per hour with the jackhammers. Last year the output of the quarries averaged 1,233 tons per 8-hour day.

Loading equipment consists of Bucyrus-Erie 50-B and 54-B electric shovels (1½- and 2¼-cu. yd. capacities, respectively), and a 51-B 2-cu. yd. diesel unit purchased last year in preparation for the increased demand which will result from the



In the foreground of this picture are the three original slurry mixing tanks, with the three new tanks just behind them. Tank on the far left will store slurry ahead of the new kiln.

A view in one of the quarries shows jackhammer operations on the ledge and wagon drills working above.

mill addition. There is also a 1½-cu. yd. P&H shovel-dragline which is used for stripping and for crane work. The haulage fleet is composed of three TR-10 Easton side-dump semi-trailers drawn by F-5 Ford tractors, and two 15-ton quarry-type end-dump Euclid units. The semitrailer units, purchased in 1941 when rail haulage was abandoned are used entirely for rock haulage, while the end-dump trucks, purchased last year as a part of the quarry expansion program, alternate between hauling rock and overburden. It is planned in the near future to re-equip the semitrailers with Ford F-8 145-hp. tractors.

Crushing

Except in respect to operating hours, primary and secondary crushing will not be affected by the expansion of mill capacity. In the past the primary and secondary crushers have operated only 40 hours per week. When the new kiln goes into production, these two units will be operated on a two-shift basis five days a week.

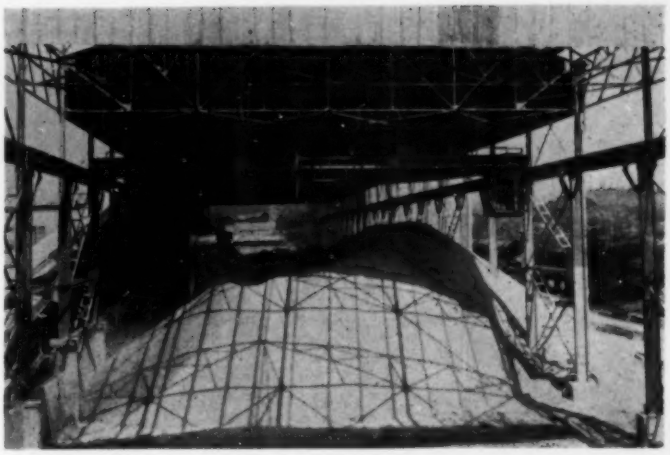
The quarry stone is dumped directly into a 36-in. Allis-Chalmers Superior McCully gyratory-type crusher. A 30-in. inclined belt conveyor takes the discharge of the primary to a reciprocating feeder above a Dixie Non-Clog Mogul 5050 hammermill. The latter discharges onto a 24-in. belt conveyor which feeds the stream of material into the storage building, where it is handled, distributed, and eventually fed to the mill tanks by an 8-ton P&H bridge crane. Shale is fed to the storage system through a hopper located beside the secondary crusher and a belt conveyor which parallels the stone belt.

Actual construction work on the plant addition begins at the long steel-frame building in which raw materials and clinker are stored, two 22-ft. covered bays having been added to the east end for stone storage, and a single 22-ft. uncovered bay at the west end for additional storage of clinker as well as sand, gypsum and other purchased raw materials. The enlarged building is 80 ft. wide by 484 ft. long. A reclaiming tunnel is being constructed under the east end to facilitate the movement of stone.

Grinding The original Volunteer installation included four identical 7- by 39-ft. F. L. Smidth Unidan mills, two for raw and two for finished grinding, all housed in the same building. In 1948, before the present mill addition was even contemplated, the company installed a fifth Unidan mill 7 ft. 3 in. in diameter by 29 ft. in length, to handle the finer grinding required for certain of its finished products. This move happily left a sufficient reserve of finished grinding capacity to take care of the third kiln now being installed. The third mill is vented to a Sly dust collector.

On the raw grinding end, a sixth Unidan mill, identical with the four original units, is now being installed to restore the original balance between raw and finshed grinding. Electrical equipment for this new mill, including a 600-hp. synchronous motor, is being furnished by Allis-Chalmers. Like the older units, it will be fed by a Schaffer Poidometer from a supply tank located in the adjacent storage building. This phase of the work will require a one-bay extension of the grinding building, a part of which will be used to house a new 1,665 c.f.m. Gardner-Denver stationary compressor. The new compressor will supplement the output of three older Ingersoll-Rand units located in the same building, providing the additional air that will soon be required for drilling in the quarries and for slurry agitation.

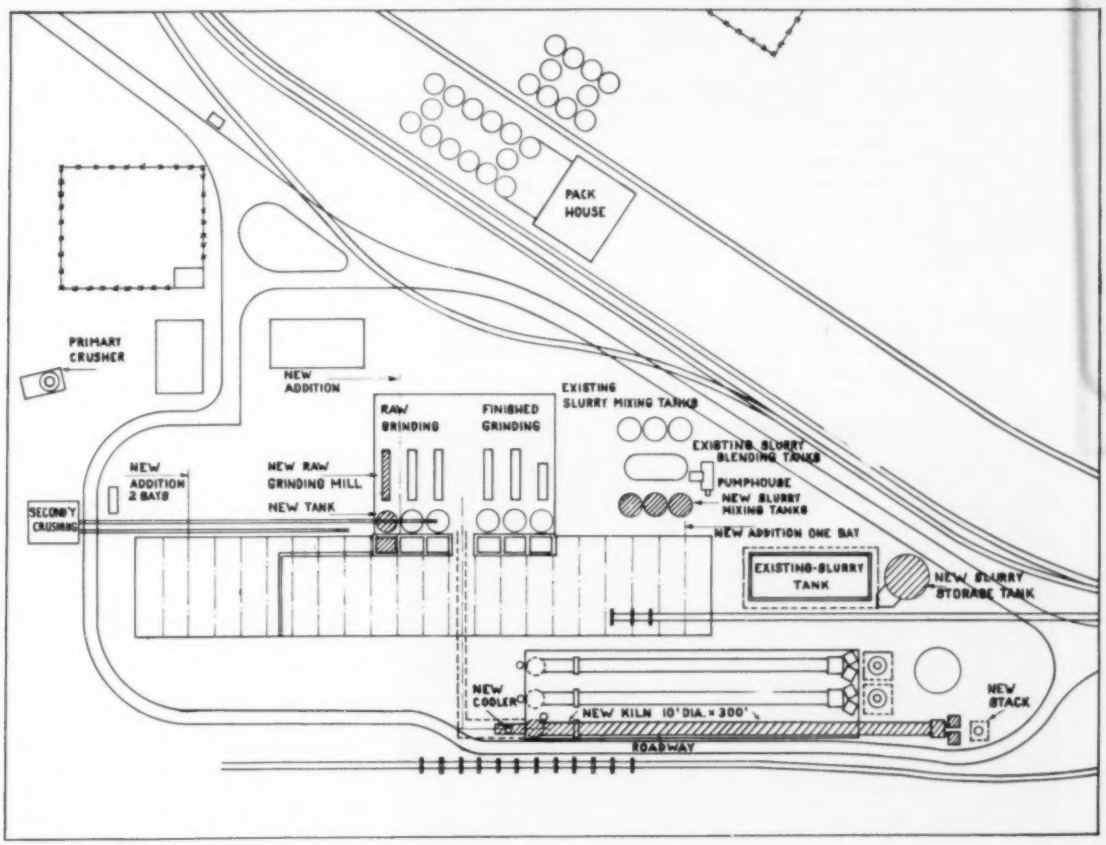
Loading one of the semi-trailer, side-dump units at the quarry face. The quarry-type, end-dump truck at the right is used for both rock haulage and the removal of overburden.



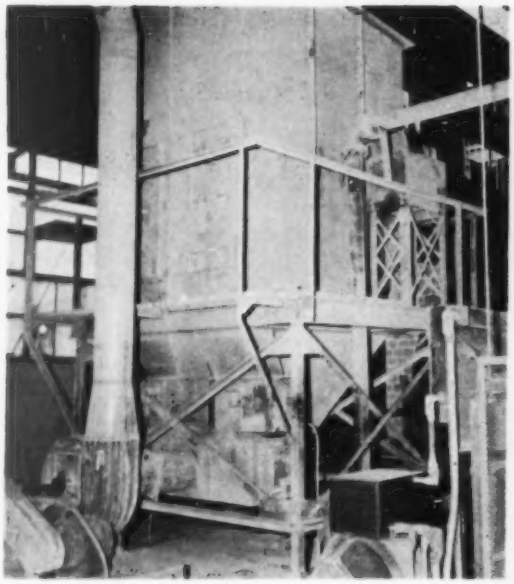
Two 22-ft. covered bays have been added to this end of the storage building to accommodate larger quantities of raw materials.

Slurry Tanks In the absence of any surplus tank capacity for mixing and storing slurry, four new concrete tanks have been constructed as a part of the expansion program. Three of these, with a capacity of 600 bbls. each, will be used as mixing tanks, and the fourth, of 4,500 bbls. capacity, as a storage tank for the new kiln. An intermediate tank adjacent to the three original mixing tanks will be adequate for blending under the new setup. The new tanks (like the older units) will be equipped with F. L. Smidth agitating equipment, and all pumping will be done with Wilfley pumps. The lower portions of the tanks, which are elevated to obtain some gravity flow, are used for plant offices and for tool and supply store rooms.

Kiln The new Vulcan kiln, which was in process of erection when the accompanying photographs were taken, is of welded construction. It was delivered to the plant by rail in three 100-ft. sections. It will be supported on five concrete piers pitched at 7/16 in. per ft. The drive will be a 100-hp. Allis-Chalmers variable-speed motor operating through Texrope V-belts and a Falk 93:1 ratio gear reducer to a conventional pinion and girth gear assembly. The kiln will have the F. L. Smidth chain system extending back 66½ ft. from the discharge end, and the Smidth spiral

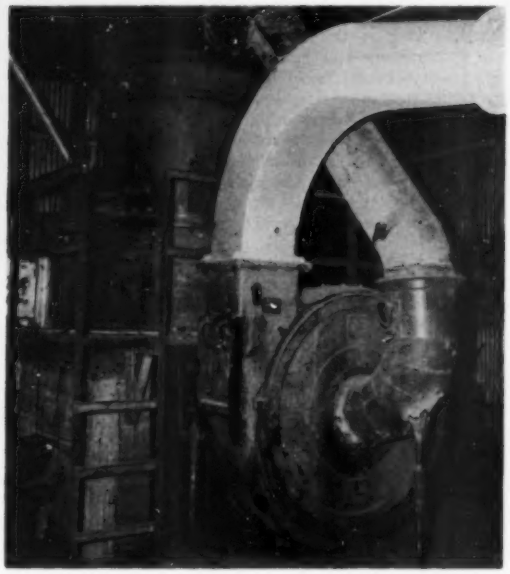


Plan of the Volunteer plant, showing additions and improvements.



The new finish grinding mill installed in 1948 is vented to this dust collector.

The direct-firing bowl mills were installed on the original kilns in 1949. A unit of the same type but of larger capacity will serve the new kiln.



scoop, synchronized with the drive motor, will be used for feeding. The firing hood and the air-cooled discharge end are being supplied by Allis-Chalmers. Clinker will be cooled by an Allis-Chalmers shaking-grate-type cooler measuring 4 ft. 6 in. in width by 70 ft. in length.

The new kiln will be fired with a No. 473-A Raymond direct-firing bowl mill, making this method of firing standard on all three units. No. 452 Raymond mills were installed on the two original kilns in 1939. The new installation will include a Buell dust collector, and similar equipment has been purchased for application to the older kilns as soon as the new unit is in operation. This step will necessitate changing the original kilns from natural draft to induced draft. A 9-ft. 6-in. by 100-ft. steel stack will be erected to serve the third kiln.

Instrumentation on the new kiln will include front- and back-end recording pyrometers, automatic draft gauges, and synchronization of feed with the drive motor. The control panels and pyrometer system will be furnished and installed by F. L. Smidth.

No changes are contemplated at present in either the packhouse or the storage system. Including 11 silos built in 1940, the mill now has a total of 26 silos, with a capacity of 140,000 bbls. The packhouse, in which there are three four-tube St. Regis packing machines, handles the output of the two existing kilns on a single-shift operation. By switching to two-shift operation it will easily handle the production of all three kilns.

The key men in the Volunteer organization are J. Ross Hanahan, president, Howell J. Davis, vice president, W. P. McKinney, sales manager, E. Earl Evans, secretary-treasurer, Charles F. Lewis, general manager, H. M. Weatherly, purchasing agent, E. E. Calloway, superintendent, and C. M. Roberts, traffic manager. The current construction program is being supervised by Mr. Lewis, who served as construction engineer when the original plant was built 22 years ago.

A view of the control panel which serves the present kilns.

Compromise Prevents Strike At Petoskey Portland Cement

C.I.O. employees of the Petoskey Portland Cement Company at Petoskey, Mich., recently ratified a new contract giving them a 7-cent-an-hour general wage increase and night differentials.

Under a compromise agreement an insurance demand was dropped, ending a dispute which threatened the company with its first strike in 29 years of operation.

(*From page 117*)

a combined capacity of 3,000 bbls. daily. The third kiln, which will be in operation late in 1950, will bring the capacity up to 5,000 bbls. daily. After the new grinding units are in place the plant will have three Unidan mills in both departments. All are equipped with 850-hp. Symetro gears. The packing at this plant is also done with Fluxo packers.

Padeswood plant—The new plant at Padeswood is the first postwar cement plant in Great Britain to go in operation and has a capacity of 4,000 bbls. daily. The two Unax kilns are equipped with slurry preheaters, modern chain systems and cross installations in the same way as the new kiln at West Thurrock. Grinding equipment consists of two Unidan mills each for slurry and clinker grinding. All are driven by 900-hp. Symetro gears. Pneumatic conveying systems carry the cement to storage, and the packing plant is equipped with Fluxo packers.

Scotland In 1948 it was reported that the combined capacity of Scotland's four cement plants represented less than one-third of the country's normal requirements. Careful study has revealed that the use of all-native raw materials is not economically practicable, so an alternative method is now being tried out. The plants have all been remodeled to use blast furnace slag. The plants at Newmains and Wishaw use limestone and blast furnace slag (hill and fresh granulated), silica, and gypsum. Only the gypsum is imported. At Clydebank portland (rapid-hardening) and slag cements are made, while the entire output at the Coatbridge plant is slag cement.

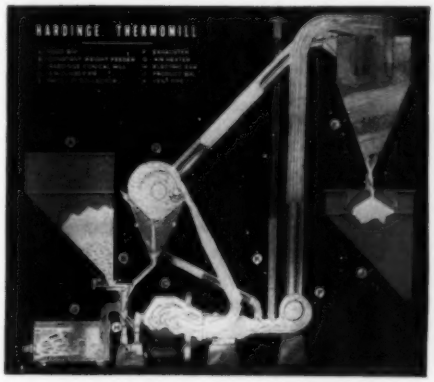
HUNGARY

The Ministry for Heavy Industry in 1949 announced that the Hungarian cement industry has completed its Three Year Plan production quota and that a Five Year Plan will be adopted. The five cement plants in Hungary are in Felsogalla, Labotlau, Belapatfalvia, Selyp, and Peremend. The Peremend plant, completely destroyed during World War II, was rebuilt and put back into production in December, 1949.

ICELAND

In March, 1948, a law was enacted authorizing the Icelandic government to make a loan up to U. S. $2,300,000 for the establishment of a cement plant at Landeyri, with a

"Don't jump! There's still hope! Try the HARDINGE THERMOMILL!"



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The Hardinge "Thermomill" is an ingenious combination of Conical Mill, air classification system and air preheater. It dries, grinds and classifies — in a single system — materials carrying an appreciable amount of surface moisture, reducing them to dry, finely-ground products.

The need for a separate dryer is eliminated.

Raw product is fed into the mill where it is ground and dried simultaneously. The ground particles are picked up by the air stream, oversize is returned to the mill feed by the classifier, and the product collector removes the finished material from the air. An auxiliary fan on the vent pipe (not shown) maintains a vacuum in the system for dust-free operation and pulls hot gases from the heater to the mill. Moisture is discharged through the vent.

Write your nearest Hardinge office for complete details. Ask for Bulletin 17-B-8.

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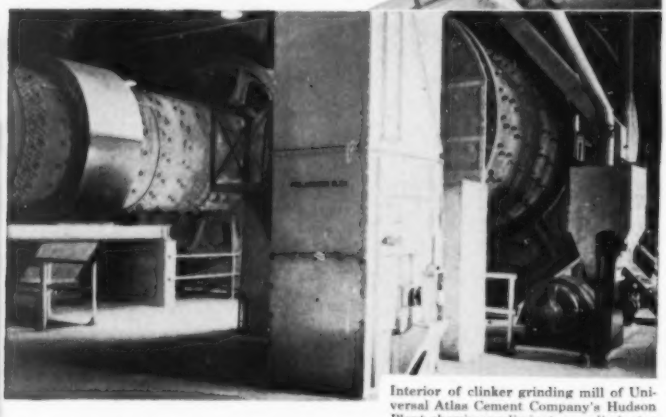
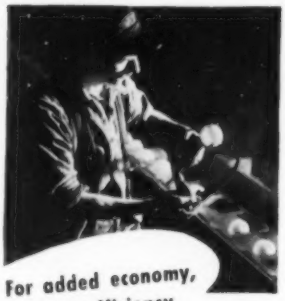


Interior of clinker grinding mill of Universal Atlas Cement Company's Hudson Plant, showing preliminator, preliminator elevator and No. 1 ballpeb.

The benefits of Lorain Rolled Plate Linings are reflected in the cost sheets and production charts of all types of grinding mills. Because the parts are made to accurate size and in easily-handled sections, they save hours of labor and reduce mill down-time. And because of the toughness of the rolled steel from which they're made, linings can be kept in service until extremely thin, thus plates of reduced thickness can be used—increasing the usable diameter of the mill and boosting output.

In some applications, as lift bars wear down in service, Lorain Rolled Plate Liners may be restored to full grinding efficiency—and to the equivalent of a second lining—by reversing the lift bars, at only partial lining cost. Since the liner plates are symmetrical and interchangeable, they may be reversed to opposite ends of mill to balance wear when pronounced variance in wear occurs at feed and discharge ends. Such flexibility and ease in restoring lining efficiency means reduced grinding costs.

U·S·S Lorain Rolled Plate Linings are available through leading mill manufacturers whose names will be furnished upon request.



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LORAIN ROLLED PLATE LININGS AND U·S·S GRINDING BALLS

UNITED STATES STEEL

capacity of 75,000 metric tons per year. It was to be operated as a state project. Its capacity would just about meet the needs of the country, as imports in 1946 were 73, 498 tons and in 1947 they were 63,688 tons. (To be continued in later issues.)

New Test Kiln

(*From page* 107)

pressed air pipeline or from a special small blower.

The light weight and the small dimensions of the test kiln permit portability and require only a very small space for its installation.

Test burning of lime, magnesite, gypsum, a.s.o.—In the small test kiln, magnesite, gypsum, and other minerals can also be burned under the same conditions as those in the large shaft kilns. To make trials with semihydrate of plaster of paris, hot air preheated by an electric heater, with regulator for the desired temperature, must be used; coal cannot be employed.

This small and easily-operated test kiln is not only of a great help for the works engineer and chemist in making test burnings, but also enables the scientist to do interesting new research work by burning different raw materials under different conditions and at small expense.

Summer Car Lubrication Discussed by an Authority

Engines of automobiles and trucks can be assisted in reaching maximum performance in the critical hot and dusty summer months which lie just ahead, according to B. B. Settle, director of service for the Dodge Division, Chrysler Corporation.

Mr. Settle points out that adequate lubrication is of special importance during the hot summer days. Oil not only lubricates the moving parts of the engine; it has three other important functions: (1) to act as a coolant for the bearings and other rubbing surfaces; (2) to seal the piston rings so that they will hold compression and not lose power between the piston and the cylinder wall; and (3) to help keep the engine clean by carrying small particles of metal, dirt, and carbon from the engine to the filter element.

According to Mr. Settle, the best-by-test summer lubricant is SAE 30, for both current and earlier models.

An infant industry in the Emmett, Idaho, area is the Gem Silica Company, an operation recently opened by Ted and Del Dewey. The plant will process sand for use in sand-blasting, foundry molding, chicken grits, and plastering sand. Output is expected to be about 75 tons per day.

Loading Rotary Kiln

(*From page* 102)

The heat available will be

$$\frac{3{,}500{,}000 \times D^2_1}{4}$$

and the heat requirement will be 12,900,000 x cross-sectional area of the load.

The following table and graph (Figure IV) illustrate numerically and pictorially how these two items are related.

D_1 ft.	h ft.	Sectional area of the load (Sq. Ft.)	Load heat Requirement B.t.u.'s/hr.	Heat developed B.t.u.'s/hr.
3	2.0	9.05	117,800,000	24,700,000
4	1.5	6.07	78,500,000	43,800,000
5	1.0	3.38	43,500,000	68,500,000
6	.5	1.22	15,750,000	98,700,000

From these data, and especially from the graph (Figure IV), it is seen that the curves intersect at $D_1 = 4.6$ ft. and B.t.u.'s/hr. = 57 million. This is an impossible operation for such a kiln, since the maximum fuel development, in this case, is not established by D_1 but by the kiln shell diameter D, and is 43,500,000 B.t.u.'s/hr.

It will be noted, however, that the heat-available curve intersects the ordinate of 43.5 million when $D_1 = 4.0$ ft. Thus the value of h will be

$$\frac{7 \text{ ft.} - 4 \text{ ft.}}{2} = 1.5 \text{ ft.}$$

which is the proper loading for the 8 ft. diameter kiln under the conditions specified.

With this depth of load, the cross-sectional area of the load will be 6.03 sq. ft., so that the heat requirement per square foot of load cross-section will be about 7.2 million B.t.u.'s/hr.

Although it will prove necessary to reduce the kiln speed under these loading conditions, it is a peculiar circumstance that this reduction in kiln speed is not exactly an inverse proportion to the increase in the ratio of the load cross-sectional areas.

Thus

$\frac{3.38}{6.03} = .563$ is the inverse of the area ratio increase.

But the kiln speed need not be reduced to 56.3 percent of its prior value. Generally it will be about 20 percent greater, or

$$\frac{A_1}{A_2} \times 120 = \frac{3.38}{6.03} \times 120 =$$

67.5 percent.

In any event, it will be generally

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found that properly loading the kiln will result in a net gain in the production rate, and a corresponding reduction in the unit weight fuel requirement.

In our example, it can be assumed that the kiln speed must be reduced only 32.5 percent.

It was remarked earlier that for the lighter kiln loading the kiln speed was such that the material travel rate through the kiln was 34.4 ft./hr. The rate of travel is directly proportional to the kiln speed, so that

$$34.4 \times .675 = 23.25 \text{ ft./hr.}$$

will be the material travel rate with the heavier loading and with $D_i = 4.0$ ft. and $h = 1.5$ ft.

Then

$$\frac{6.03 \times 23.25 \times 90}{2000} = 6.32 \text{ tons/hr.}$$

will be the new production rate.

Something on this order will be accomplished without using more fuel than formerly, so that the heat requirement per ton of product will be reduced from 7,250,000 B.t.u.'s to 6,880,000 B.t.u.'s. Furthermore, the daily production will be increased to about 152 tons. And the greater mass of material under process in the kiln will prevent violent fluctuations in conditions, with the result that greater uniformity of product quality will be attained.

Open New Morton Salt Mine At Grand Saline, Texas

Work was begun recently at the Morton Salt Company's new Kleer mine near Grand Saline, Tex., after an eight-week stoppage at the firm's former workings. The shut-down was caused by an order of AFL officers preventing union members from working the old mines on the grounds that they were not safe.

More than 150 men will be employed at the new plant one mile south of Grand Saline when full-scale operation has been reached. (This means a reduction in personnel from old setup, which required 250 men.)

J. Y. Bell, manager of the Morton company in Grand Saline since the retirement of J. E. Haines on November 1, 1947, has been transferred to Chicago as mining engineer. His successor at Grand Saline has not been named.

Mines Bureau Issues Bulletin On Use of Respirators

Although dust respirators offer a temporary means of reducing dust-inhalation hazards in coal mines, this safety equipment is not a substitute for effective dust-control measures, the U. S. Bureau of Mines emphasizes in an information circular released recently.

A free copy of the report, *The Use of Dust Respirators in Coal Mines*, may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

Report on Current Labor Developments

By S. HERBERT UNTERBERGER

Director of Research
Labor Relations Information Bureau
Washington, D. C.

BY far the most significant labor development of the last month was the labor agreement signed by the General Motors Corporation and the United Automobile Workers, C.I.O. That agreement had four principal features:

1. Duration: the agreement is for five years, with no opportunity for either party to reopen for any reason whatever.

2. Wages: an increase of 4 cents an hour immediately and further increases of 4 cents an hour at the beginning of each year thereafter. Additional increases of approximately 1 cent an hour each time the B.L.S. cost-of-living index rises 1 point. These cost-of-living increases may be lost if the index declines.

3. Pensions: a pension of $100 a month, including Social Security benefits to each worker with 25 years of service who retires at age 65 or over. Smaller pensions will be paid to workers with 15 to 25 years of service. These pensions will go higher if Social Security benefits are raised—up to approximately $117 a month.

4. Union shop: in a slightly modified form. Present union members must stay in the union or lose their jobs. New employees must join the union within 90 days and remain members for a year. At the end of that time they may leave the union without losing their jobs.

This contract certainly is different from others signed this year in the automobile industry or, for that matter, anywhere else. Whether it will set a precedent or start a new trend still remains to be seen.

Businessmen are entitled to draw certain conclusions from the action of General Motors. Here is the biggest and most successful company of them all. Also, it is likely to be among the best informed. Its actions are not only based on its estimate of the future course of the economy, but its action may also determine that future course.

What, then, were General Motors officials thinking about when they agreed to this most unusual contract? Certainly no one can say precisely what was in the minds of the negotiators. But, for the most part, the actions speak for themselves.

It is likely that if General Motors had wanted only an ordinary one-year contract, it could probably have settled for no more than the settlements at Chrysler and Ford. The union had just experienced a long and costly strike at Chrysler and probably was not eager to start a new strike against an even more powerful adversary. No wage increase might have been necessary, no more liberal pension plan might have been required, and no union shop might have resulted.

But, obviously, the General Motors officials wanted more than a short peace and they were willing to pay a price for 5 years of stability. They were predicting that business would continue to be good for

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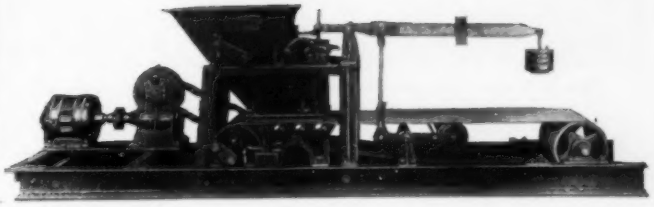

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the next 5 years. This is one of the most optimistic predictions ever to come from a reliable business source.

They did not necessarily say that business was going to get better. It must be pointed out that they did not agree to keeping any number of workers continuously employed. All they said was that, for the workers who are employed, their wages will rise by 20 cents an hour by May 29, 1954.

As a matter of fact, unless the output of General Motors rises—and this seems very unlikely—there will probably be fewer General Motors workers 5 years from now. In one of the most significant but little publicized clauses of the contract, the union agrees to cooperate in technological improvements. This is very different from the attitude of many unions who oppose such improvements if they are going to lose jobs as a result.

And this goes to the second proposition underlying General Motors action. It appears clear that representatives of General Motors management were willing to grant an annual 4 cents per hour wage increase because they expected to increase their efficiency at least enough each year to pay for the raise. Here they were probably out of the realm of guesswork and in the area where they knew pretty accurately what their rate of progress was likely to be.

With respect to these regular wage increases, General Motors action will certainly set a precedent which other businessmen may have to follow. If these other businessmen cannot look forward to similar increases in efficiency, they may find themselves hard pressed indeed.

General Motors executives also agreed to increase pensions if Social Security benefits rose. Here they were probably guessing that, sooner or later, other employers would have to do this anyway. Since, every time pensions are increased, large amounts of money have to be laid aside in a fund, General Motors management chose to start laying the money aside right away. But, having agreed to this more liberal pension arrangement, it has also made it more certain that other employers, particularly in the automobile and steel industries, will have to follow suit. And these precedents have a way of spreading very far and wide.

Finally, General Motors agreed to a union shop. From one point of view this was the most unexpected concession of all. General Motors has consistently opposed greater security for the union. It now appears to have reversed its position. To be sure the contract does protect present employees who do not want to become union members, and new employees may quit the union after a year. Apparently the unions have little fear of losing members after they have had a year to make good unionists out of them.

In agreeing to a union shop, however, General Motors appears to have come to the conclusion that the union is here to stay, for it is assuring the union of continued strength. This action was really a necessary complement to the 5-year contract. That contract is only as good as the parties can make it. For the union to live up to its obligations, it has to be strong. It has to have the allegiance of all or nearly all the workers. If it is to prevent strikes, including wild-cat strikes for a period as long as 5 years, it has to be able to maintain discipline. General Motors apparently recognized that an insecure union could not perform these functions and, therefore, gave up one of its long-standing contentions.

Other employers are almost sure to have the General Motors contract

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quoted to them as a precedent. In preparation for that time, they would do well to think through how their situation compares with General Motors; whether they are able to make the same assumptions about their business future and whether they are also willing to make substantial concessions to secure stability.

Blue Diamond Mining Methods Told in New Bulletin

Mining, milling and manufacturing methods used at the Blue Diamond Corporation's integrated gypsum property in Clark County, Nev., are described in a publication of the Bureau of Mines recently released by the U. S. Department of the Interior.

Free copies of Information Circular 7555, *Mining, Milling and Manufacturing Methods at the Blue Diamond Corporation's Gypsum Property, Clark County, Nev.*, by George H. Holmes, Jr., may be obtained by writing to the Publications Distribution Section of the Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.

At Murphy, N. C., the Hitchcock Corporation will reclaim iron-stained talc which heretofore has been discarded. The firm will process the material at its new bleaching plant, using a method developed by Tennessee Valley Authority and North Carolina State College specialists.

Heavy-Media Separation Used in Diamond Recovery

Heavy-media separation is now being used on a large scale for the recovery of diamonds from blue ground in South Africa.

Based on pilot plant investigation over a period of two years in an 80 t.p.h. heavy-media separation plant, Premier (Transvaal) Diamond Company, Ltd., Cullinan, T. V. L., recently commenced operation of a large scale heavy-media separation plant. This is said to be one of the largest such plants in the world (feed rate 13,000 tons per day) and was designed and erected by Fraser & Chalmers (S.A.) Ltd., Johannesburg, South Africa.

There are now 77 commercial heavy-media separation plants in operation or under construction for the benefication of 16 different minerals in addition to diamonds.

Homebuilding Volume Hits 126,000-Mark During April

Homebuilding activity for the first third of 1950 reached new record proportions, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics. In April alone, builders started 126,000 new permanent dwelling units, an increase of 16,000 (15 percent) over March, and 37,700 (43 percent) over April, 1949.

So far in 1950 each month has been record-breaking in the number of new dwelling units started. From January through April, 1950, new housing units totaled almost 395,000, which surpasses 1949 activity for the same months by 53 percent. Last year, the half-million mark was reached in July; this year it seems quite likely that a half a million new dwelling units will have been started by the end of May.

The acceleration in homebuilding activity was country-wide, according to preliminary reports from local building-permit officials. When the first four months of 1949 and 1950 are compared, the most striking advances this year were reported for the West North Central, Middle Atlantic, East North Central, and West South Central states. In all of these areas, the number of new dwelling units authorized for construction was about double the volume for the January-April period in 1949.

For the first four months, the East North Central states led all other regions this year in the volume of new dwelling units for which permits were issued, followed closely by the Pacific, Middle Atlantic, and West South Central regions. Last year for the same period, the Pacific states led by a wide margin.

The Zonolite Company, engaged in mining and processing vermiculite, has opened a new processing plant in Los Angeles. Scheduled for operation on June 15 was another new plant in Jacksonville, Fla.

DONEGAL MANUFACTURING CORP.*

MARIETTA, PENNSYLVANIA

NI-HARD

★ Grinding Balls
★ Mill Liners
★ Custom Castings

AVAILABLE FOR IMMEDIATE SHIPMENT
— ANYWHERE —

*Authorized Producer of Ni-Hard by The International Nickel Co., Inc.

This Belt Takes a Terrific Beating

Manhattan Conveyor Belts are Built to Take It

This 30" Manhattan Conveyor Belt is handling hot filtered cement. Slurry conveyors such as this are notoriously tough on belts, but this Manhattan installation in an Oklahoma cement plant is paying for itself over and over.

Manhattan engineers are "Belting Pioneers" when it comes to designing conveyor belts for special duty.

HOMOCORD — Special Cushioned Construction . . . Only for Conveyor Belt Use

In Homocord Conveyor Belt, Manhattan engineers devised a Strength Member that gives with the shocks of loading and dissipates hard blows. It has been called a "Rippling Muscles Construction" because the Homocords have a flexible, resilient, rolling action with each other. Homocord Conveyor Belt is Cushioned, Tough, Flexible and Mildew-Proof, also holds metal fasteners.

RAY-MAN — for Extra Long Lifts

Another Manhattan "First", built with Rayon Cord Strength Members. A "Tension Master" construction for longer lifts where you want to eliminate troublesome transfer points.

Whatever your conveyor belt needs, call a Manhattan Conveyor Belt Engineer to advise you on possible ways to lower your stone and aggregate handling costs.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RM

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive & Diamond Wheels • Bowling Balls

The Story of Huron Portland Cement — Another

ALLIS-CHALMERS

Equipped Cement Plant

Keep Your Eye on Huron — to See How Record Cement Tonnage is Produced..

HURON PORTLAND CEMENT Company's multi-million dollar Alpena, Michigan, plant now produces a record 6,200,000 bbls of cement annually. This represents an increase of 50 percent over the original installation . . . an expansion program made to meet increased cement demands for housing, industrial expansion and concrete highways.

In Huron's stepped-up cement production, Allis-Chalmers has supplied much equipment: rotary kilns, crushers, dryers, grinding mills, other basic and auxiliary equipment. The result is a modern, flexible plant layout, with synchronized, automatic operation in all phases of production.

Check the operational steps here at Huron Portland Cement Co. — shown in pictures on these pages — or in the many modern cement plants throughout this country and the world. Chances are, you'll find Allis-Chalmers equipment as an integral part of sound plant design. And sound design means highest net profits for you.

Your nearby Allis-Chalmers area representative can show you how A-C cement plant equipment — and engineering — can help you get low costs and efficient production.

ALLIS-CHALMERS, 974A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

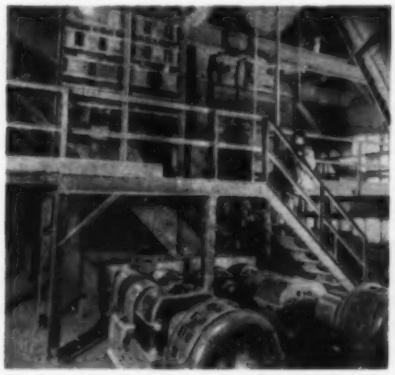
HOW ALLIS-CHALMERS FITS INTO CEMENT MAKING

Here's another example of the broad range of Allis-Chalmers equipment for cement — installed in world's largest cement plant. A-C can design a complete cement plant — and furnish all equipment, too!

1 Huge quantities of limestone are required for Huron's annual 6,200,000 bbls of cement. Quarry-run limestone — 20 tons at a time — are dumped into 60 x 84-in. Fairmount crusher, one of two installed side by side in quarry near cement plant.

2 Each Fairmount crusher can munch up 20 tons of limestone in 32 seconds. Crushed product is hoisted to scalping screens. All minus 4-in. stone is conveyed to dryer building on conveyor.

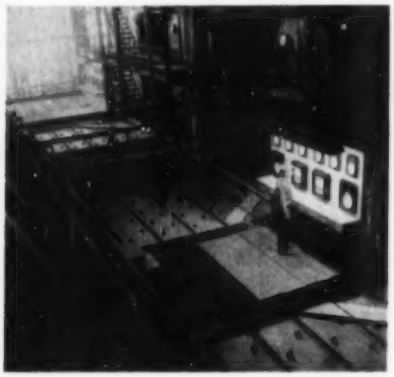
6 Limestone and shale from the dryers is screened on 4 x 8 ft Ripl-Flo vibrating screens. Hammer mills beneath screens reduce 4 to ½-in. feed to minus ¾-in. Screens handle 100 to 110 T.P.H.



7 So far, limestone and shale have been handled separately. They meet at proportioning scales, which weigh out one part shale to four parts limestone into a balanced "raw mix." Screw conveyors beneath scales are driven by Allis-Chalmers motors.

8 Nine raw grinding Compeb mills, 7 x 26-ft, grind the stone and shale combination into suitable feed for rotary kilns. A division head separates these A-C mills into two compartments.

12 White hot cement clinker falls from kiln over Allis-Chalmers air-cooled kiln end (segmental alloy steel sections below refractory brick) which prevents kiln warpage and nose brick troubles.



13 Waste heat boilers, one for each rotary kiln, utilize reclaimable heat from kiln exhaust gases to generate steam. 7,303,500 lbs of steam are generated every 24 hours at Huron . . . producing power enough to drive all machinery in the plant.

14 Kiln-run cement clinker is crushed in battery of four 636 Hydrocone crushers. Each of these Allis-Chalmers machines reduce 324 bbls per hour from minus 1½ to 2-in. feed to a minus 1-in.

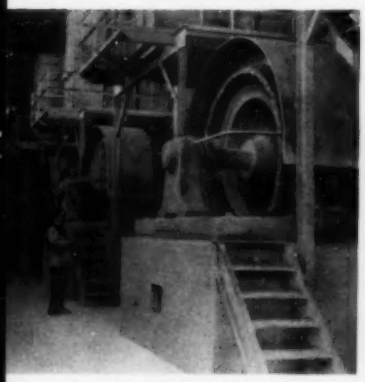
PRODUCER OF THE WORLD'S WIDEST RANGE OF CRUSHING,

AT HURON PORTLAND CEMENT COMPANY

3 Conveyor housing contains four endless belts 1200 ft long, driven by Allis-Chalmers motors. Shale, another major ingredient of portland cement, comes from another quarry in hopper cars.

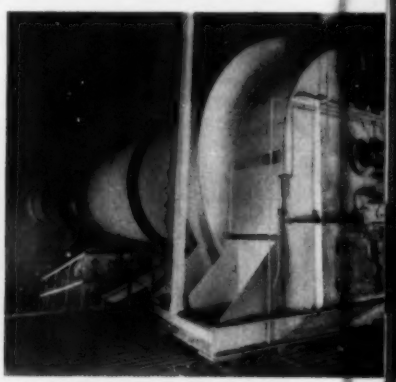
4 Shale drops from bottom of hopper cars to chain grizzly in dryer building. It is then fed to a 24 x 60-in. Allis-Chalmers single roll crusher which reduces it to a minus 6-in. product before going to rotary dryers for moisture removal.

5 One of four A-C rotary dryers in dryer plant dries stone and shale by tumbling material through stream of hot gases. Four 7 x 100 ft dryers handle limestone. Two 8 x 100 ft units dry shale.

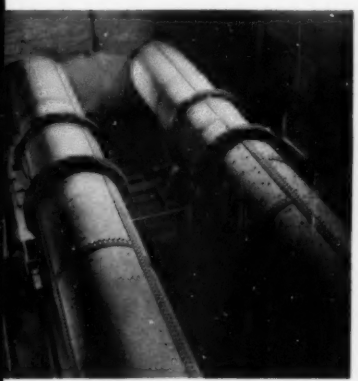


9 Raw grinding mills are driven by Allis-Chalmers 500 hp synchronous motors. Smaller Allis-Chalmers motors drive screw conveyors for feeding raw mix to Compeb mills.

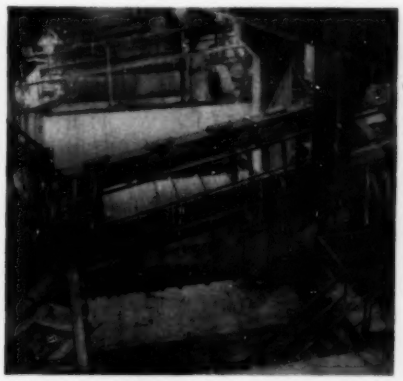
10 Raw mix goes to rotary kilns. Each of these 10 x 153½-ft Allis-Chalmers kilns produce 55 bbls of cement clinker per hour. Temperatures in kiln reach 2700° F. in clinkering zone, 15 to 20 ft from discharge end. There are 18 kilns at Huron.



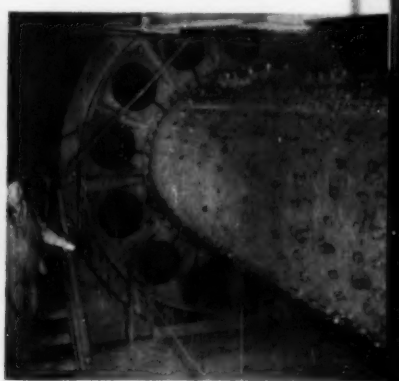
11 Firing hood. Coal from overhead bin is pulverized in bowl mill, then blown into kiln. Auxiliary waste heat stack alongside firing hood conveys hot gases to dry coal before it enters kiln.



15 Gypsum is dried in these A-C 5 x 50-ft rotary dryers, then crushed. About 30 lbs of gypsum are added to each 1000 lbs of clinker to keep cement from setting too rapidly.



16 Finish grinding. Twelve 7 x 24-ft two-compartment Compeb mills grind clinker to a powder so fine it will pass through a sieve capable of holding water. Each mill operates in closed circuit. Product is 1950 surface area; 90% passes a 200-mesh screen.



17 Finish grinding is the third clinker reduction. After crushing and preliminary grinding, each of these twelve mills turns out 80 bbls of finished cement per hour.

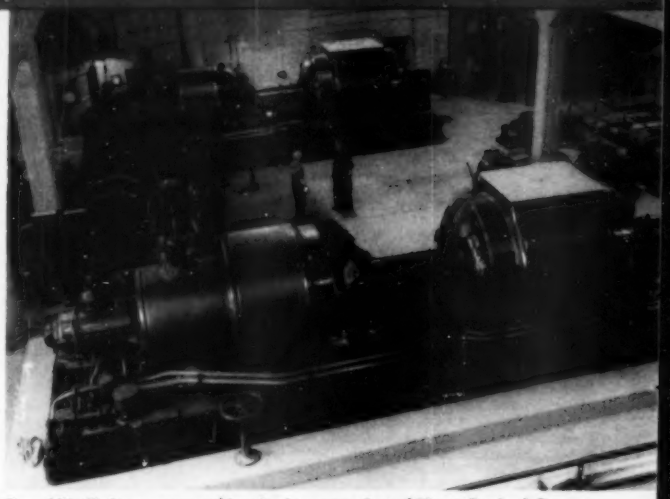
MINING AND CEMENT EQUIPMENT **ALLIS-CHALMERS**

"One Company" Responsibility is Big Advantage

IN PLANNING AHEAD for big volume production, Huron Portland Cement Co. considered it practical to specify Allis-Chalmers for a great number of their equipment needs.

Past experience had proved the value of Allis-Chalmers equipment in terms of performance . . . and in terms of durability that results in real savings in downtime and maintenance.

Allis-Chalmers equipment can be obtained complete with motors, drives, control, all built by one company, with mechanical and electrical factors matched for best working efficiency. And — A-C maintains a large staff of field engineers trained, not only in equipment engineering, but in prompt cooperation in seeing to it that equipment keeps operating at rated performance.

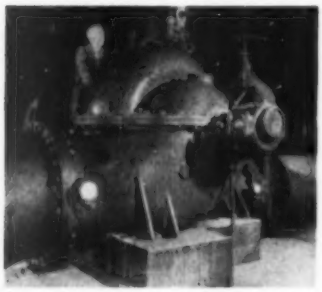


Four Allis-Chalmers steam turbines in the power plant of Huron Portland Cement Co. are typical of the reliability of Allis-Chalmers turbines. The two 3500 kw units shown above were installed in 1921 and 1924. Two others, 4,000 kw and 10,000 kw turbines, have been in operation since 1915 and 1930, respectively.

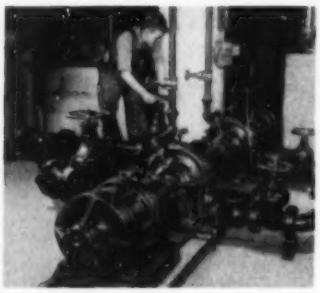
Battery of Allis-Chalmers distribution transformers, 1000 kva each, step down voltages from 4160 to 440 volts for plant use. 400,000 kw are handled daily.

Allis-Chalmers motor control for rotary kiln provides electrical synchronization for kiln feed, cooler fan, feeder, bowl mill, dust screw, kiln tank feeder, etc.

Steam from turbine is condensed in this 96-in. two-pass Allis-Chalmers surface condenser. Condensate goes to water softening plant, then to waste heat boilers.



Large Type "S" pump, 20,000 gpm, 10 ft head, draws water from Lake Huron to a large turbine well, where it is drawn for plant use.



Two 6 x 3, 325 gpm, 100 ft head Allis-Chalmers condensate pumps handle condensate water from condenser. Each is driven by 15 hp Allis-Chalmers induction motor.

ALLIS-CHALMERS

MILWAUKEE 1, WISCONSIN

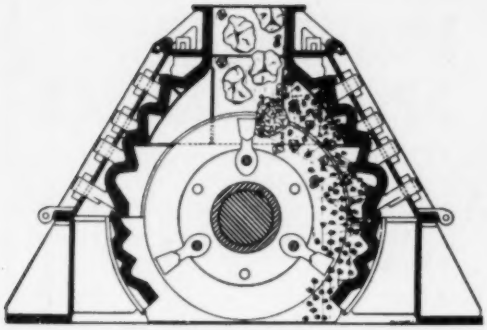
A-C ALLIS-CHALMERS

Rigi-Flo, Fairmount, Compeh, and Hydrocone are Allis-Chalmers trademarks.

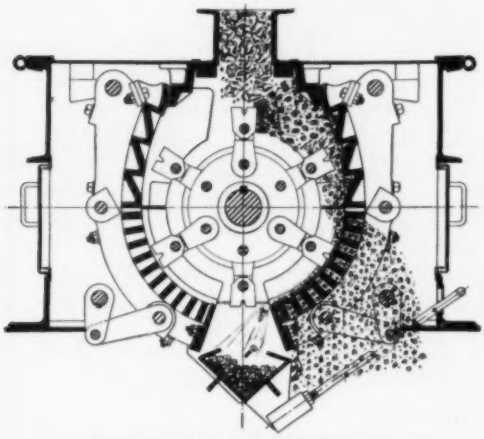
Pioneers in Electrical Power Equipment—Biggest of all in Range of Industrial Products

In the Cement Industry it's "PENNSYLVANIA" and "DIXIE" CRUSHERS

2 to 1

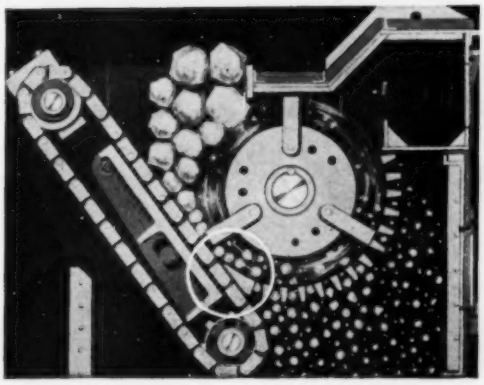


PENNSYLVANIA REVERSIBLE IMPACTOR



PENNSYLVANIA REVERSIBLE HAMMERMILL

DIXIE NON-CLOG HAMMERMILL



As of May 1, 1950, The Bath Iron Works Corporation, through its subsidiary, the Pennsylvania Crusher Company, purchased the Dixie Machinery Manufacturing Co. The combination of these two lines of crushers provides by far the most varied source of crushers and crushing know-how for cement plant operators. Whatever your crushing problem may be, you can be assured that our line is so complete and our experience in crushing so broad that our recommendation will be most profitable for you.

Use PENNSYLVANIA REVERSIBLE IMPACTORS For—

1. Low-cost, secondary crushing of high-silica and abrasive feeds.
2. *Minimum fines* in the product.
3. 100% controlled top size product along with minimum power and maintenance requirements (Impactor closed-circuited with external screens or separators).

Use PENNSYLVANIA REVERSIBLE HAMMERMILLS For—

1. Economical, secondary reductions of low-silica, relatively non-abrasive materials.
2. *Maximum fines* without closed-circuit crushing.
3. *Nominal* top size product containing maximum percentage of intermediate sizes.
4. When not possible to install external closed-circuiting equipment.

Use DIXIE NON-CLOG HAMMERMILLS For—

Top performance when handling sticky or mucky materials.

The *moving* breaker plate eliminates plugging. Also, the lower end of this breaker plate is extended downward, permitting close clearances between breaker plate sections and grate bars. This eliminates passage of oversize, assuring most accurate product control.

PENNSYLVANIA CRUSHER COMPANY
Division of Bath Iron Works Corporation
1713 Liberty Trust Bldg., Phila. 7, Pa.

DIXIE MACHINERY MFG. CO.
Division of Bath Iron Works Corporation
4208 Goodfellow Ave., St. Louis 20, Mo.

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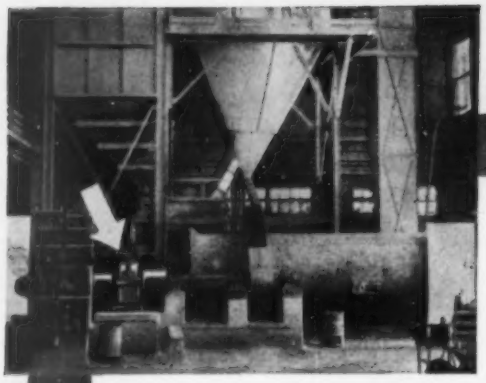
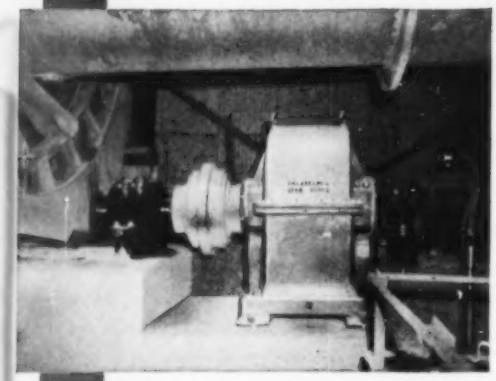
PENNSYLVANIA CRUSHER COMPANY
DIVISION OF BATH IRON WORKS CORPORATION





3 well known Cement Plants

choose

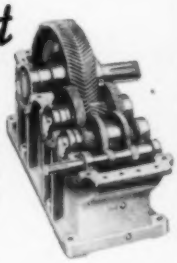
PHILADELPHIA HERRINGBONE SPEED REDUCERS

TOP A triple reduction Herringbone unit driving Kiln in a St. Louis Cement Plant.

CENTER A kiln drive of a Dallas plant operating through a triple reduction Philadelphia Herringbone Reducer.

LOWER A Houston plant drives this tube mill through a double reduction Philadelphia Herringbone unit.

Economical... Efficient



Philadelphia Herringbone Units are noted throughout industry for their long, highly efficient and trouble-free service, even under the most severe conditions—Single, double and triple reduction types with standard reduction ratios from 1.75 to 1 up to 320 to 1.

HOUSINGS

Housings are fully enclosed, compact and self-contained with absolute freedom from oil leakage. Liberally proportioned bearings permit external overhung loads on output and input shafts.

GEARS

Symmetrical arrangement of gears is a feature which produces equal loads on the bearings of each shaft and allows a more compact design.

LUBRICATION

Gears and bearings are lubricated by the same lubricant, and the ample sized oil reservoir insures cool operation.

For complete details—send for Catalog H-49—Please write on your Business Letterhead.

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CAN YOU AFFORD A FEEDER WITHOUT THESE 6 FEATURES?

1. **SPROCKET TEETH** . . . replaceable without removing sprockets.
2. **SELF-CLEANING LINKS** . . . they won't jump.
3. **LINKS CAST INTEGRAL WITH PANS** . . . no bolts to lose.
4. **ALL WEARING PARTS** . . . pans, links, sprockets, rollers . . . of cast super-manganese steel.
5. **PANS INTERLOCKED** at four points . . . can't sag.
6. **MOUNTED** on heavy structural steel bed . . . braced and reinforced.

Lone Star Cement Installs Another Pioneer-Oro Feeder

What better recommendation for a feeder than repeat orders? Last year Lone Star Cement Corporation, one of the world's largest cement producers, installed another PIONEER-ORO Feeder. This huge feeder is 45 feet long with a clear width of 5 feet.

Money can't buy a stronger, tougher feeder! All wearing parts . . . pans, links, sprockets and rollers . . . are of cast manganese steel. The patented pans in this Lone Star installation are $\frac{1}{8}$" thick, each weighing 800 pounds. Four supporting points on each pan prevent sagging, even without rollers. PIONEER-ORO Feeders are made in widths up to six feet, and lengths to meet your requirements.

In addition to a broad line of PIONEER-ORO Feeders, Pioneer builds Traveling Grizzly, Forged Steel Apron and Heavy Duty Mechanical Feeders—in many sizes. Mail the coupon below for further feeder information.

BUY BOTH!

Higher Output, Lower Upkeep!

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Continuflo **EQUIPMENT**

MAIL COUPON TODAY!

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● Please send information on the equipment checked.

- ☐ PIONEER-ORO FEEDERS
- ☐ APRON FEEDERS
- ☐ TRAVELING GRIZZLY FEEDERS
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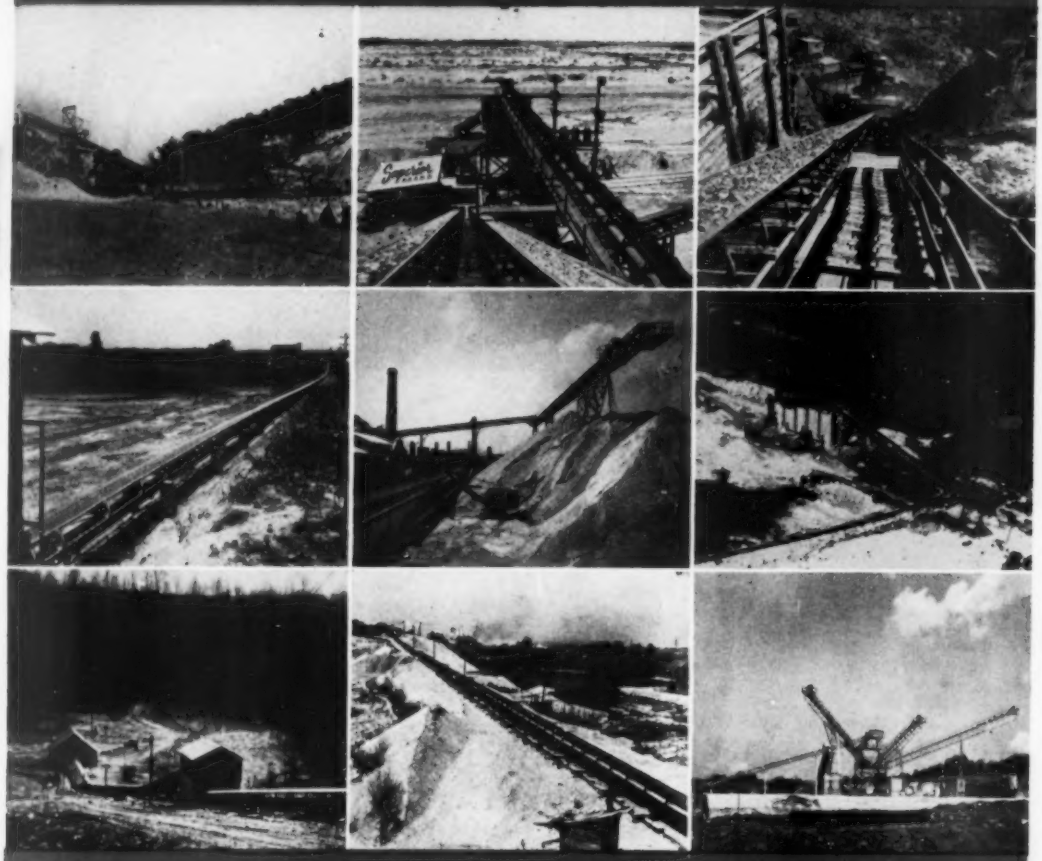
STONE HANDLING!

These are tough jobs—requiring sturdy equipment for long life and uninterrupted service.

That's why these operators specified *Continental*



OTHER PRODUCTS: Elevators, Feeders, Screw Conveyors, Pulleys, Trippers, Buckets, Sprockets, Takeups and Bearings.

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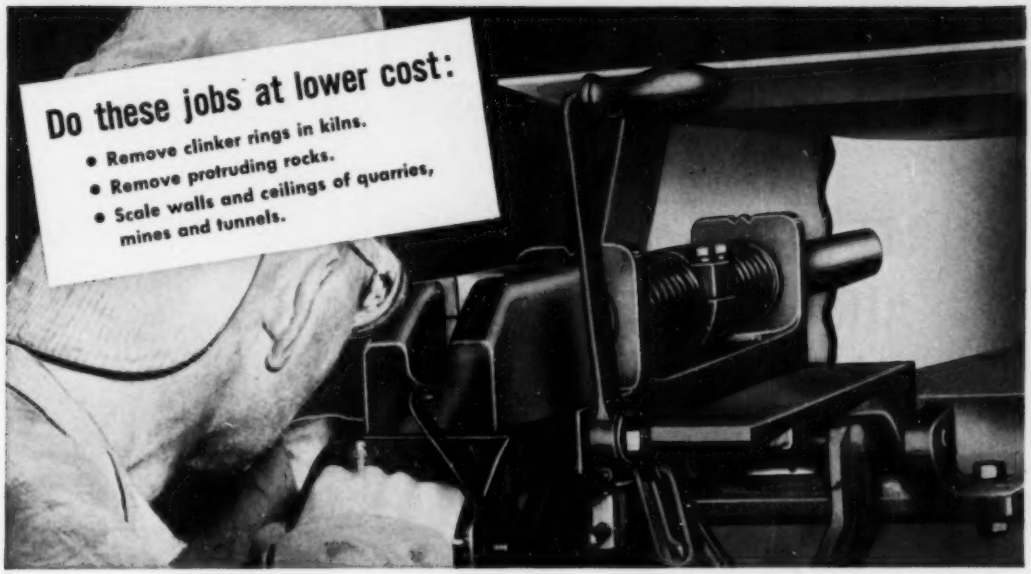
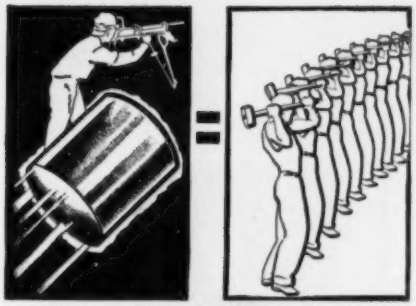

Do these jobs at lower cost:
• Remove clinker rings in kilns.
• Remove protruding rocks.
• Scale walls and ceilings of quarries, mines and tunnels.

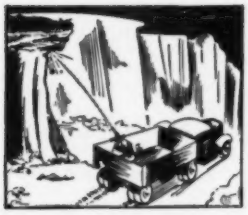
The Remington Industrial Gun will save you time and money!

Especially designed for the cement and mining industries . . . the new Remington Industrial Gun eliminates old-fashioned sledge-hammer methods of "barring out" clinker rings! One man operates it . . . firing a few well-placed shots that loosen the clinker ring and cause it to crumble when the kiln is rotated. There's no need to shut down the kiln and consume time cooling and reheating it.

For folder giving further information, write to Remington Arms Company, Inc., Bridgeport 2, Conn.



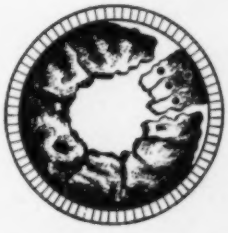
ONE MAN . . . OR MANY? The Remington Industrial Gun makes it possible for one man to destroy heavy obstructions that formerly required the time of several men with hand tools, working in restricted or hazardous positions.



The Remington Industrial Gun Has Many Uses

It's handy for scaling the ceilings and walls in mines. The illustration shows how the gun can be used to remove protruding rocks, ice and other obstructions at inaccessible points where conditions permit this kind of operation.

Remington Industrial Guns are leased—$200.00 the first year, $25.00 per year thereafter.



Cutting a "key way." A few well-placed shots will loosen a section of clinker . . . weaken the rest of the ring . . . usually cause it to fall when kiln is rotated.

Remington Industrial Shells are loaded with a powerful 3-ounce lead projectile that develops 7475 foot-pounds muzzle energy.

"If It's Remington—It's Right!"

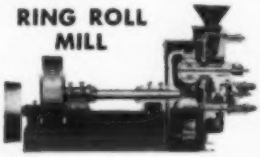
Remington DU PONT

STURTEVANT AIR SEPARATORS

Produce Aggregates that meet Government Specifications

Sturtevant Air Separator in "closed circuit" with pulverizer. This combination increases tonnage and reduces costs in all types of industry.

RING ROLL MILL



Range 10 to 200 mesh. Use this mill in closed circuit with Sturtevant Air Separators.

On dam projects throughout the country, Sturtevant Air Separators are helping contractors meet U. S. Corps of Engineers specifications for proper analysis of aggregates. Here's how — Sturtevant Air Separators de-dust and remove the fine fraction according to the mesh required. Dry or damp sand can be handled in any tonnage desired in ranges from 30 mesh and finer to eliminate screen in the production of intermediate sizes.

The de-dusted sand of proper mesh is then inter-blended with the screened sand or aggregates in the proper proportions providing aggregates that meet specifications.

Sturtevant Air Separators are fast and accurate. They increase production of aggregates, cut production costs.

Investigate Sturtevant Air Separators for your jobs. Write for details, today.

STURTEVANT MILL COMPANY

104 CLAYTON STREET, BOSTON 22, MASSACHUSETTS

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS MECHANICAL DRYS and EXCAVATORS • ELEVATORS • MIXERS

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is the word that best describes
KRAFT made-to-order
heavy-duty multi-wall
shipping sacks
produced in our new plant at St. Marys, Georgia
DEPENDABLE bag paper . . . made to exacting specifications in our own mill
DEPENDABLE bag design . . . by our own practical packaging engineers
DEPENDABLE workmanship . . . by personnel with long experience in multi-wall bag construction
DEPENDABLE plate-making, and dependable printing with improved presses and inks
DEPENDABLE deliveries and service . . . by rail or water right from our own doorstep.
• Sewn or pasted—valve or open mouth—2 ply or up to 6 ply . . . you can depend on "Kraft" both as a source of supply and as a source of complete satisfaction.
KRAFT BAG CORPORATION
A DIVISION OF GILMAN PAPER CO.
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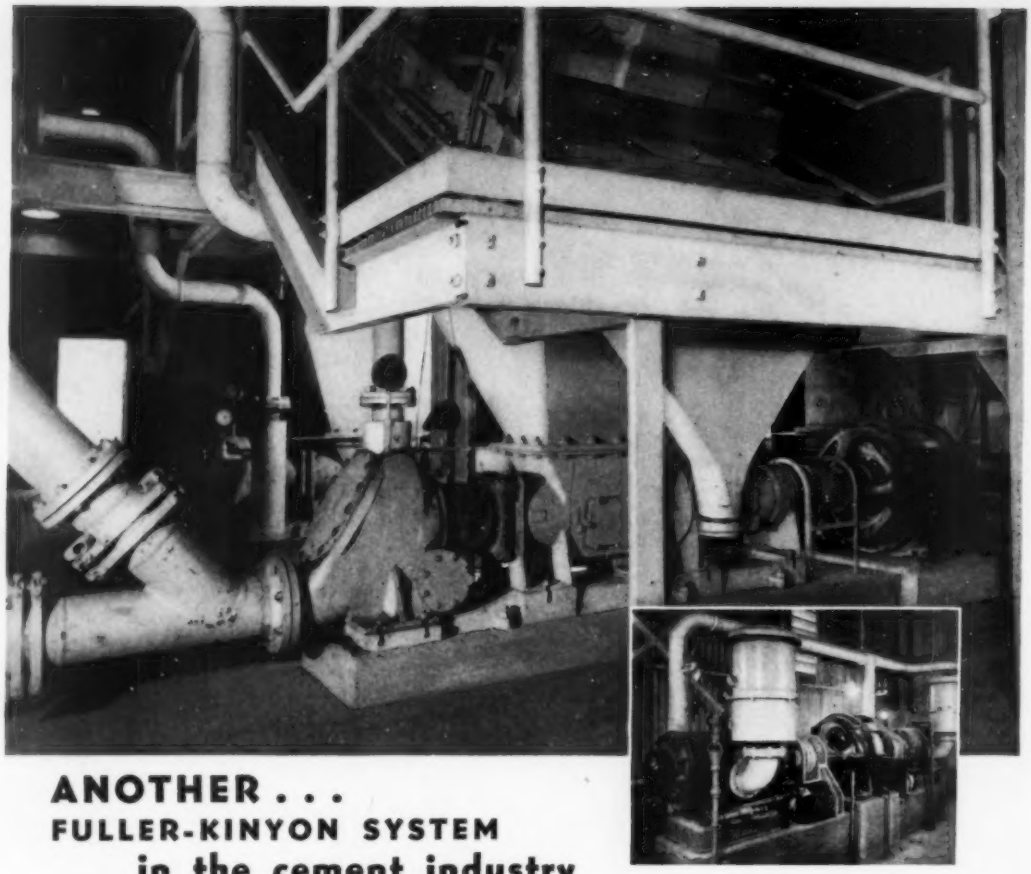
Western Sales Office
Daily News Bldg., Chicago 6, Ill.
Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Coltawood Corp.
• Kraft Bag Corp.
The long, white building in the foreground is the newly completed addition to the Kraft Bag Corporation's plant in St. Marys, Georgia
Send your product to market in a "KRAFT BAG"—the container for a thousand uses!



ANOTHER . . .
FULLER-KINYON SYSTEM
in the cement industry

Following the general practice, of practically all cement plants in this and many other countries, when this mid-western cement company decided to extend its storage and bulk-loading facilities, it again selected the Fuller-Kinyon System as the most efficient and economical conveyor. Two Type L Pumps were installed to convey cement from the finishing mills to three sets of silos . . . maximum conveying distance 1385 feet; capacity of each pump, 376 barrels an hour.

Air for the Conveying System is furnished by two Fuller Rotary Duplex Single-stage Compressors, each of which has a capacity of 2010 c.f.m. at 35 psig.

Cement plants throughout the country have found that the combination of Fuller-Kinyon Pumps and Fuller Rotary Compressors, provide by far the most efficient, trouble-free and economical method of conveying yet developed. Air, at the proper pressures to handle the job at minimum cost and maintenance, is always available where and when it is needed.

To call in a Fuller Engineer to survey your present conveying system places you under no obligation. It may be your long first step toward more efficient and profitable operation.

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS, AND ASSOCIATED EQUIPMENT

fuller

FULLER COMPANY, Catasauqua, Pa.
120 S. LaSalle St., Chicago 3
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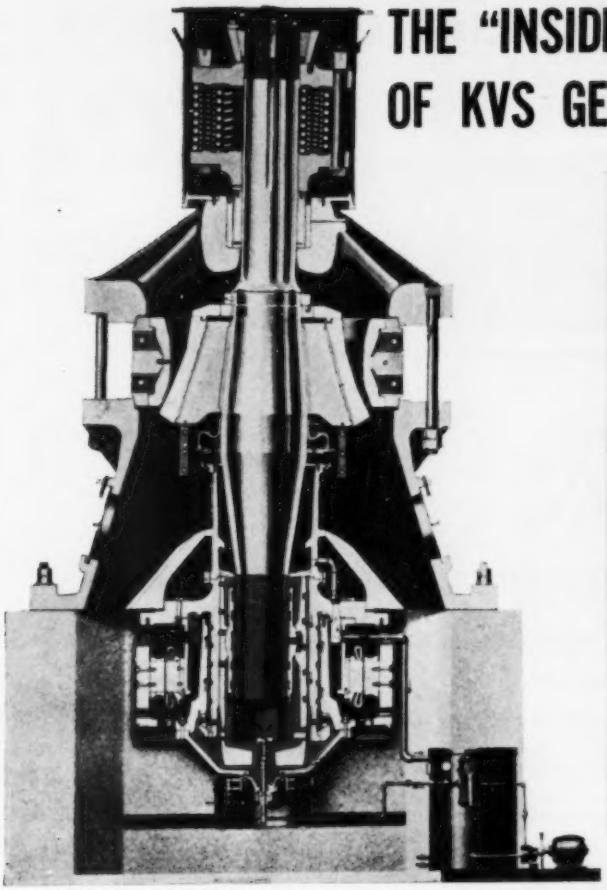
P-117

IT COSTS LESS TO OWN THE BEST!

THE "INSIDE STORY" OF KVS GEARLESS CRUSHERS



CUTAWAY DRAWING OF ROLLER BEARING TYPE "S" CRUSHER

The oiling system is the heart of every crusher. When it fails, bearings burn out . . . weeks of valuable time are lost in making replacements . . . work stops . . . and so does income! KVS offers the solution to this ever-present problem with their positive oiling system. Built without "gimmicks" and trick safety devices that all too often fail to work, this system is virtually fool-proof.

A simple gear pump draws oil from a serpentine cooled tank and, under pressure, pumps it through a filter to a compartment below the ball socket bearing. Oil is then forced UP between this bearing and the shaft and overflows to the eccentric and pulley bearings. This floods the roller bearings, and the oil then overflows into the storage tank. A bypass releases the pressure back into the storage tank, thus maintaining a constant and even flow at all times.

It has been proved through countless tests and is, today, the "Heart" of the famous Kennedy Gyratory Crushers. It provides a system that oils vital parts without failure and without depending on someone's memory.

IT'S CORRECTLY DESIGNED TO LAST FOR YEARS

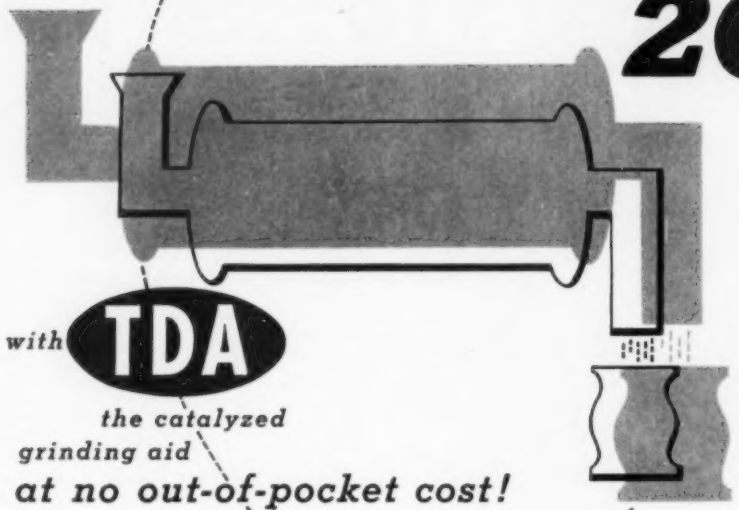
The oiling system in the Kennedy Gearless Crusher is perfect. Approximately 4 barrels of oil per hour are constantly pumped through the bearings and there is no waste—no spillage of oil. It is the most perfect oiling system that was ever put on a crusher. These crushers have been known to run for many years without renewals to the eccentric.

Send for engineering bulletin describing this system

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y.

increase your cement-mill capacity 20%



with **TDA**

the catalyzed grinding aid

at no out-of-pocket cost!

With TDA, you can in effect increase the size of your cement-grinding mill, **with no capital expenditure,** because

TDA increases the rate of grinding of your present mill

TDA reduces your grinding costs per barrel of cement

TDA guarantees most efficient mill performance

TDA works well not only with all types of portland cement, but also with puzzolanic and natural cements. Its cost is amortized as you use it. TDA pays its own way – in increased production. Let our engineers show you how to get more production, and a quality product, from your cement mill . . . at no out-of-pocket cost.

Dewey and Almy research-engineered products for the construction and paving industries:

Write today for technical information and prices.

DEWEY and ALMY
Chemical Company

Cambridge 40, Mass. Chicago 38
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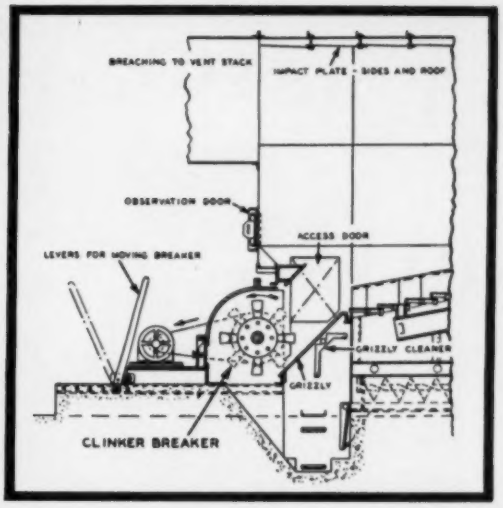
TDA – *grinding aid*
SRDA – *retarder and plasticizer*
RDA – *raw materials grinding aid*
MRDA – *retarder*
DAREX – *air entraining agent*
DARASEAL – *membrane curing compound*
DARAPHANE – *water proofing compound*
DARAKOTE – *anti-stripping additive*
AIRALON – *air entraining agent*



ON GUARD

DAY and NIGHT

That's how a Fuller Clinker Breaker will work for you . . . eliminates the human element. It stands constantly on guard to reduce every oversize (above 1½ inch) piece of clinker, coating, or ring material which will not drop through the grizzly of a Fuller Inclined-Grate Cooler.

The larger pieces slide down over the bars of the grizzly into the path of constantly moving swing hammers, which shatter the oversize pieces, throwing most of the fragments back into the cooler, where further cooling can take place. Hammer wear is at a minimum, because the breaking is done by impact, not by attrition.

Because all the clinker discharged from the cooler is in sizes less than that of the grizzly openings, it eliminates the necessity of removing large pieces by hand, in order to "unchoke" the discharge grates. This can well eliminate costly labor charges with kilns which are prone to periodic dropping of "rings", or carry mixes which "ball" easily in the burning zone.

In addition to reducing the need for close attendance, on the part of the operating force as to the state of the grizzly, clinker of a uniform top size shows several advantages in later stages of the process, viz:

(1) Choke-ups, due to accumulations of oversize pieces in chutes and spouts of the conveying system, do not occur.

(2) Irregular proportioning of mill feed, due to oversize pieces hanging up in the feed openings, is eliminated.

(3) Breaking of elevator buckets, due to jamming on oversize pieces in the close clearances of elevator boots, can be forgotten.

(4) Segregation in storage or surge bins, due to varying clinker sizing, is reduced.

(5) Clinker suitably sized for preliminary grinding is assured.

Application of the Fuller Clinker Breaker can be made to existing Fuller Coolers with no major changes to the cooler.

The photograph above shows a Fuller Clinker Breaker applied to a Fuller Cooler in a cement plant in the southwest. Four coolers are so equipped.

If you are interested, write for Bulletin CB-1, illustrating and describing the Fuller Clinker Breaker. We will gladly send you a copy.

fuller

DRY MATERIAL CONVEYING SYSTEMS
AND COOLERS — COMPRESSORS AND VACUUM PUMPS —
FEEDERS, AND ASSOCIATED EQUIPMENT

FULLER COMPANY, Catasauqua, Pa.
120 S. LaSalle St., Chicago 3
420 Chancery Bldg., San Francisco 4

CB-1

Easier Handling! Better Packing! Lower Cost!

Uniformly high quality of paper and construction has given St. Regis Multiwall Bags a preferred position in the cement industry. They assure higher production and greater efficiency and dependability right down the line.

St. Regis likewise makes an important contribution to cement manufacturers through its automatic Multiwall Bag Filling Machines. The "delayed discharge" feature of the new St. Regis 150 FC Packer—illustrated here—enables entrapped air to escape from the bag—keeps dust off—means cleaner, brighter bags.

St. Regis can help to increase production and cut costs in your plant! Write or call the *St. Regis Sales Office nearest you for detailed information.*

SALES SUBSIDIARY OF ST. REGIS PAPER COMPANY

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YOU BUY PROTECTION WHEN YOU BUY MULTIWALLS

Bradley
HERCULES MILLS

The Quickest and Most Economical Way to Increase Your Grinding Capacity

For the cement manufacturer with excess kiln capacity—operating compartment mills—the installation of BRADLEY HERCULES MILLS as preliminary pulverizers and converting the compartment mills to straight tube mills will result in INCREASED CAPACITIES of uniformly ground fine materials at an APPRECIABLE SAVING IN HORSE POWER.

Investigate the new HERCULES MILL, a moderate priced mill, that can be installed in practically any existing plant at GREAT SAVINGS in horse power with increased capacities. A RUGGED MILL—designed for MAXIMUM ACCESSIBILITY — the use of new wear-resisting metals ASSURES CONTINUITY OF OPERATION.

A great many of the larger cement plants use BRADLEY HERCULES MILLS. Among these is the largest single cement plant in the United States.

Write for Catalog No. 60.

BRADLEY PULVERIZER CO.
ALLENTOWN, PENNSYLVANIA

Norblo
Dust Collection

Always, Everywhere, Star Performance

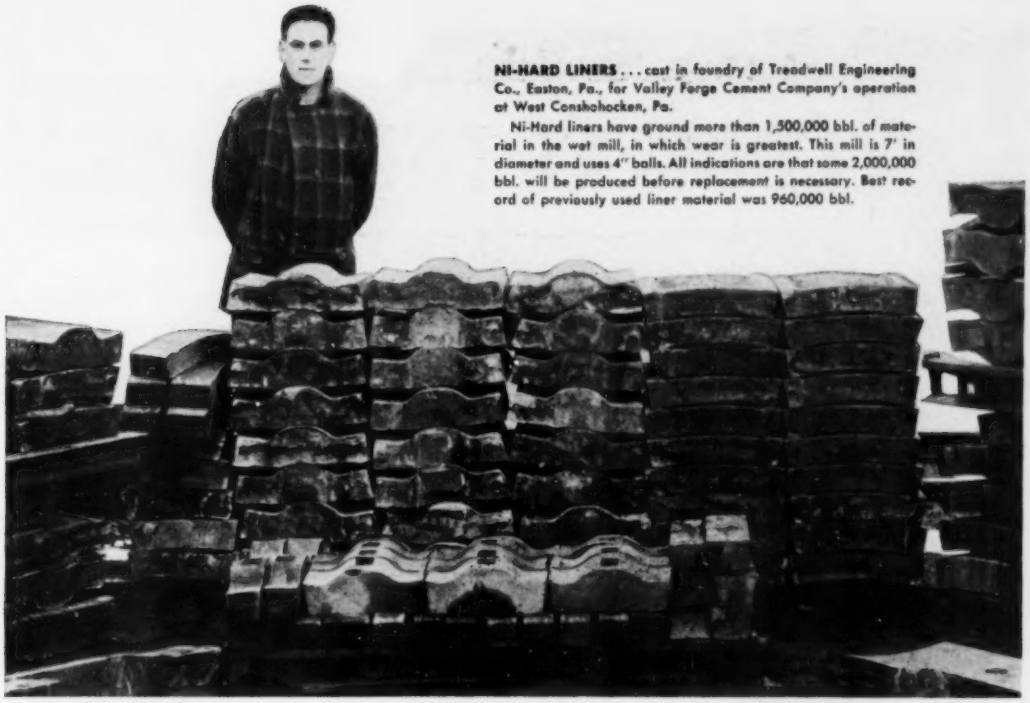
For the cement industry the combination of Norblo Cement Air Cooling with Automatic Bag Type Dust Collection, is a new type star performance. In some rock products industries heavy duty star performance includes Norblo Hydraulic and Norblo Centrifugal Collector combinations. In zinc, lead, cadmium and other smelting and mining fields Norblo Automatic Bag Type Collectors are making outstanding records for high recovery with low operating and maintenance costs, in some of the largest installations ever built in the hemisphere.

Profit by Norblo 30 years' experience in heavy duty dust collection and Norblo development of these basic types of equipment. Write for bulletin — or tell us your problem.

THE NORTHERN BLOWER COMPANY

6407 BARBERTON AVENUE • CLEVELAND 2, OHIO

Automatic and Standard Bag Type Fume and Dust Collectors • Norblo Centrifugal and Hydraulic Collectors • Cement Air Cooling Systems • Exhaust Fans



NI-HARD LINERS . . . cast in foundry of Treadwell Engineering Co., Easton, Pa., for Valley Forge Cement Company's operation at West Conshohocken, Pa.

Ni-Hard liners have ground more than 1,500,000 bbl. of material in the wet mill, in which wear is greatest. This mill is 7' in diameter and uses 4" balls. All indications are that some 2,000,000 bbl. will be produced before replacement is necessary. Best record of previously used liner material was 960,000 bbl.

Still Good After Grinding 1,500,000 Bbl...

NI-HARD DOUBLES LIFE of CEMENT MILL LINERS

THESE LINERS solve one of the toughest problems in the cement industry . . .

And the reason? They are cast in NI-HARD® . . . a nickel-chromium white iron that is the hardest commercial product of the iron foundry . . . hard enough to scratch glass. This extreme hardness . . . at the moderate price of Ni-Hard . . . provides abrasion resistance at *lowest ultimate cost.*

For 20 years, Ni-Hard has set notable records in fields where abrasion commonly takes a heavy toll. A typical example is reported in the caption of the illustration, above. Performance of Ni-Hard is unmatched in both the wet and dry grinding of stone, and in finish grinding operations.

Try Ni-Hard wherever you encounter severe abrasion. See for yourself how its remarkable properties minimize replacements and save you money. Consult us on the uses and sources of this economical nickel-chromium iron . . . it's available from coast to coast from authorized producers.

EMBLEM OF INCO SERVICE

The International Nickel Company, Inc., Dept. PQ,
67 Wall St., New York 5, N. Y.

Please send me free booklets entitled:
"ENGINEERING PROPERTIES AND APPLICATIONS OF NI-HARD" *and*
"BUYERS GUIDE FOR NI-HARD CASTINGS"

Name.....*Title*.....
Company.....
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City.....*State*.....

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

LOOK AT THE RECORD

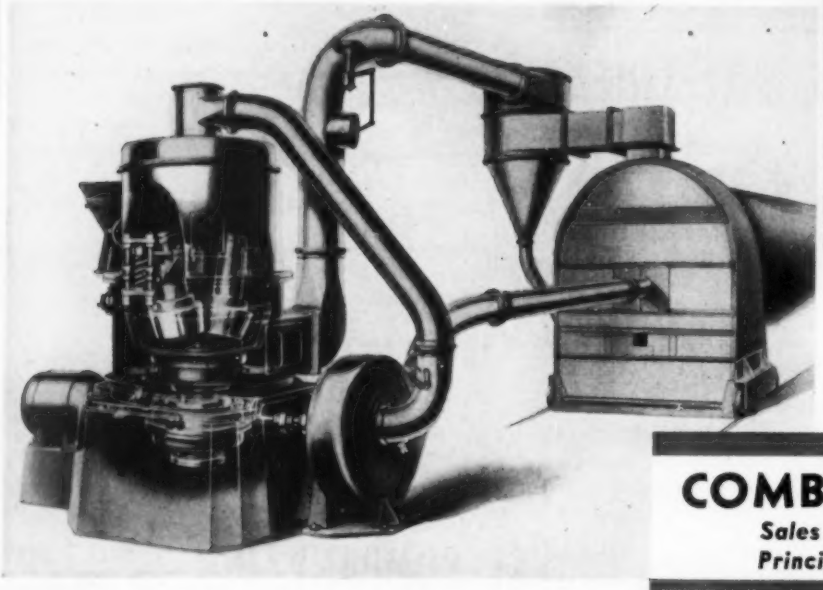
SINCE its first installation in 1935, the Raymond Bowl Mill has won industry-wide recognition throughout the cement, lime, burned dolomite, and similar fields for direct firing rotary kilns with pulverized coal.

The fifteen year record on the opposite page, shows the steady increase in the use of Bowl Mills in these industries. From the original three units installed in 1935, the list has grown to over 250 units in 1950 for firing rotary kilns alone, with a rated capacity of nearly 2½ million pounds of coal per hour and equivalent to 10,852,764 *tons* per year.

The continued leadership of the Raymond Bowl Mill is based on its proven ability to reduce over-all costs and insure top efficiency in kiln operations.

Write for Bowl Mill Catalog No. 62.

The Raymond Bowl Mill provides a complete, fully coordinated system of coal grinding and direct firing for rotary kilns.



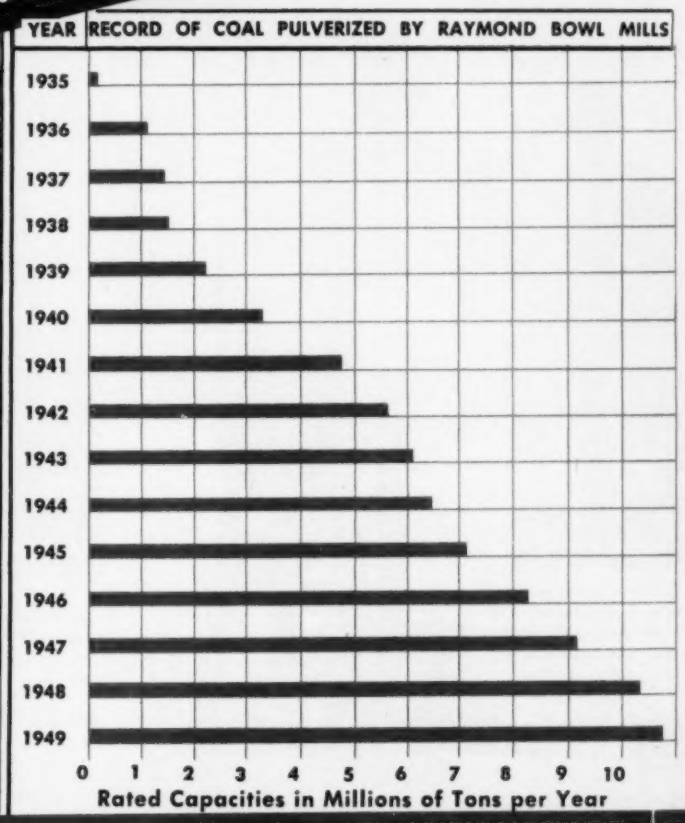
COMBUSTION

Sales Offices in Principal Cities

# of RAYMOND BOWL MILLS

Over . . .
10 Million Tons
Rated Capacity of Coal pulverized per year in the Cement, Lime and burned Dolomite fields alone

Increase in Yearly Rated Capacities



ENGINEERING-SUPERHEATER, INC.
RAYMOND PULVERIZER DIVISION
1321 North Branch Street • Chicago 22, Illinois

KEEP YOUR HANDS *Out* of cement handling!

Handling bag cement is hard on the back and tough on the pocket-book. These 3 Erie Cement Plants take bulk cement mechanically from cement cars via undertrack screw and bucket elevator to the storage bin. Whatever your cement requirements there is Erie Cement equipment to meet your needs.

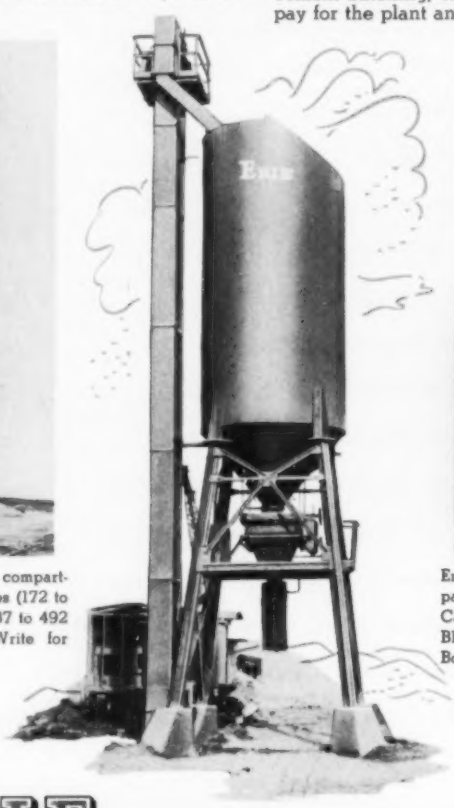
The Type "M" series at the left in 4 standard capacities will store from 172 to 600 bbls. in a portable-type plant.

The Type "L" series at the right in 3 capacities 575 to 1025 bbls. offers a knock-down or semi-portable plant for the large cement user.

The CSB-Series the "silo type" offers two diameters (11 and 12 ft.) and 5 standard capacities in each to provide storage for 274 to 1014 barrels of cement.

Give Erie engineers the description of your cement needs and their recommendations will speed your cement batching, save enough over bag handling to pay for the plant and eliminate cement waste.

Erie Type "M" portable single compartment cement plant in 4 capacities (172 to 194 Bbls.) (270 to 304 Bbls.) (437 to 492 Bbls.) (525 to 600 Bbls.). Write for Booklet M-3.



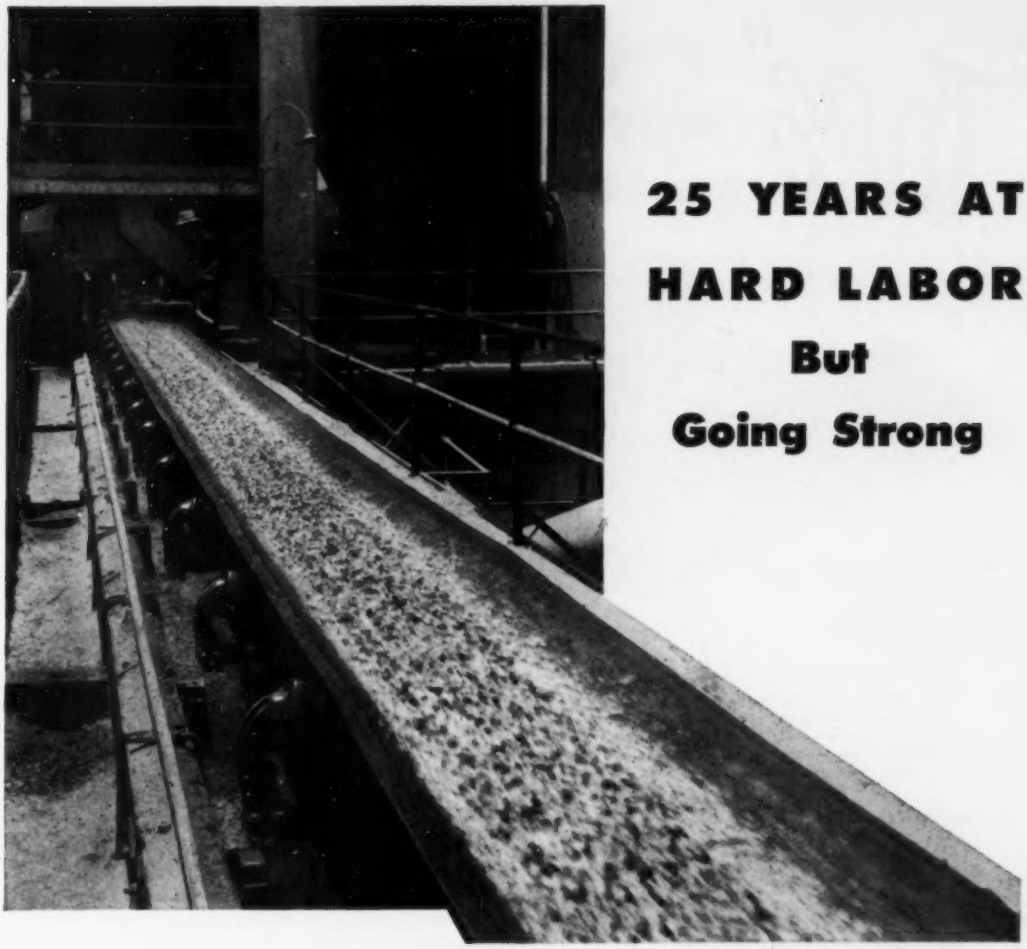
Erie Type "L" Single and Double Compartment Cement Bins standardized in 3 Capacities (575 to 645 Bbls.) (685 to 770 Bbls.) (910 to 1025 Bbls.). Write for Booklet L2

Erie CSB 592 Bbls. (11 ft. dia.) "Silo" Cement Bin shown. Available in 11 and 12 ft. diameters in 5 sizes each—also widely used for added recirculation ground storage in any capacity desired. Write for data.

ERIE

STEEL CONSTRUCTION COMPANY

607 GEIST ROAD • ERIE, PENNSYLVANIA



25 YEARS AT HARD LABOR But Going Strong

As strong and efficient as it was 25 years ago when it was installed, this rock conveying system proves the soundness of S-A design, engineering and equipment. It moves big tonnage of rock as quickly and at lowest cost per ton as if it had been installed only yesterday.

This rock handling system, operated continuously for a quarter of a century, simply proves how right S-A engineering principles have been. On every S-A designed and installed bulk materials handling system . . . the most materials move at lowest cost per ton. Even time has failed to make many such installations obsolete.

So when you consider an improvement or an entirely new system for your bulk materials put the question of what's best up to S-A engineers. There's no obligation so write today.

SOUTHWESTERN PORTLAND CEMENT CO.
VICTORVILLE, CALIFORNIA

Incoming lime rock is lifted to crusher from track hoppers under car unloading trestle by means of a huge 54" wide type "R" bucket elevator. It has 30" pitch chain and 100 ft. centers. Crushed lime is transferred to a 30" wide S-A belt conveyor which carries material out over storage area. Traveling tripper operates on rails alongside conveyor to discharge at any point along length of conveyor to storage pile below.

STEPHEN S-A ADAMSON MFG. CO.

20 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. · Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

"TOPS" WHEN THE GOING IS TOUGH!

Side bars of high carbon or alloy steel for high strength and durability.

Hardened bushings for strength and long wear. *Locked in the side bars* to confine wear to the full bearing area between hardened pin and bushing.

Side bar holes are pierced, then accurately shaved. This assures full bearing area on pin or bushing . . . accurate pitch . . . precisely parallel holes.

3-diameter pins assure easy, safe assembly and disassembly . . . are press fits in side bars only. Pins are of case-hardened, forged alloy steel, accurately milled to provide proper clearance between pin and barrel. *Pins are locked* against rotation in side bar.

other Rex equipment that's built to last

Rex Lay Bushed Chains
For general elevator service under severe abrasive conditions.

Rex Combination Chains
For general elevator service where speeds and loads are moderate.

Rex Style "A" Bucket
For general service

Rex Style "AA" Bucket
For heavier, more abrasive material.

Rex Temperim Sprocket
For extra long sprocket life.

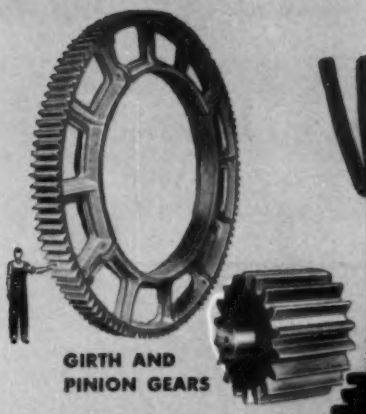
Rex Chabelco all heat-treated steel elevator chains are the ultimate where service is rough and tough! There is good reason why these all steel elevator chains last longer . . . handle more tonnage per chain dollar. It's the accurate pitch that means smooth sprocket action . . . the precision-built, heat-treated parts pressed together to stay that make **Rex Chabelco** outstanding for severe bucket elevator service.

The pins, bushings and side bars are firmly fixed. They just can't come loose, begin to wobble and cause unnecessary chain wear. Compare the "fit" of **Rex Chabelco** parts with that of any other similar chain. You'll notice at once the accurate, snug assembly that makes **Chabelco** the leader.

These *all steel* chains cost only slightly more than malleable iron chains. Get more information on how they can make your bucket elevator dollars go further. Write to **CHAIN BELT COMPANY, 1604 West Bruce Street, Milwaukee 4, Wisconsin.**

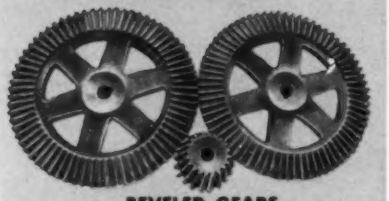
CHAIN BELT REX COMPANY

DRIVE AND CONVEYOR CHAINS

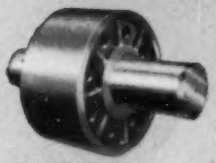


GIRTH AND PINION GEARS

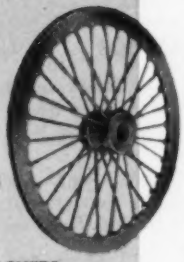
SEGMENT TIRES



BEVELED GEARS



TRUNNIONS



SHEAVES

SPROCKETS

- PRESSURE PARTS
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Wear Resistant Stroh

REPLACEMENT PARTS

for Long-Life Service on

Kilns	**Rod Mills**	**Compeb Mills**
Coolers	**Tube Mills**	**Crushers**
Dryers	**Ball Mills**	**Classifiers**

Other Similar Equipment

Since 1916!

Specialists in the fabrication of gears, tires, trunnions, sprockets and allied parts for kilns, coolers, dryers, ball mills and similar processing equipment . . . Stroh engineers have perfected a method of applying a high grade, wear-resistant alloy steel to *the wearing surfaces* only of plain carbon steel. Proved in service . . . replacement parts by Stroh assure you of maximum service life . . . economical, smooth operation of equipment. Let us show you case studies of outstanding performance. A representative will gladly call at your request, or we will quote on your requirements on receipt of your inquiry.

WRITE TODAY FOR CATALOG!

Stroh PROCESS STEEL CO.

Established 1916

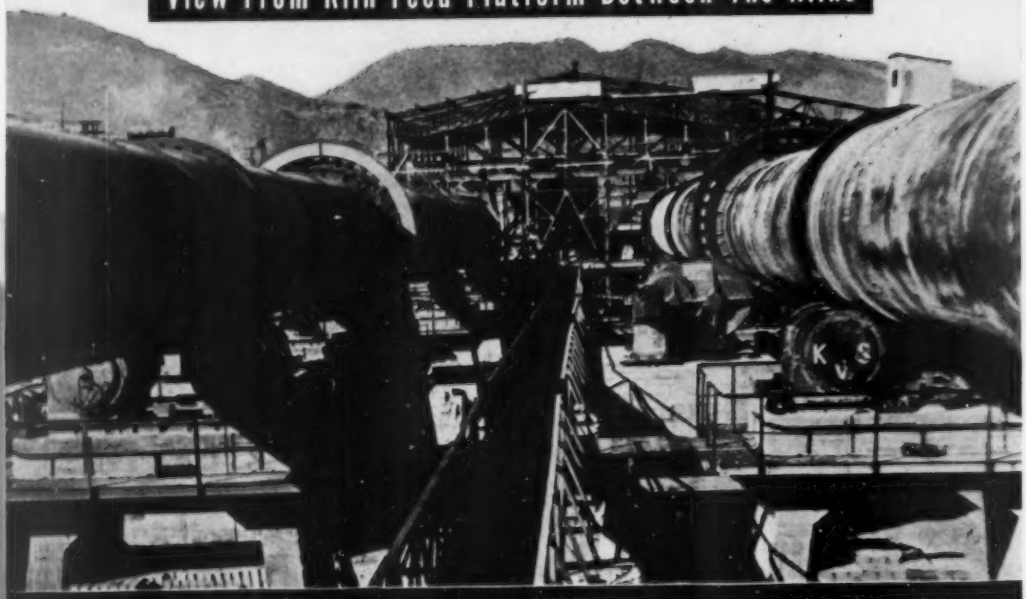
PITTSBURGH 12, PENNA., U. S. A.

WALLACE YOUNG, *South American Representative*

Manufacturers of STROH ALLOY CAST TOOTH GEARS CAST OR CUT TOOTH CARBON STEEL GEARS

IT COSTS LESS TO OWN THE BEST!

View From Kiln Feed Platform Between The Kilns



CAPACITY UNLIMITED!

Operated by gear reducer, driven by variable speed motor. Rotation of kiln may be increased or slackened, as desired. Entire operation controlled to keep pace with production needs.

Illustration shows two large KVS kilns with self aligning bearings. These kilns available in single or multiple units, built to meet your exact specifications.

Let a KVS engineer review your plant needs and recommend the proper design and size kiln to meet your needs. Long life and dependable service distinguish *all* KVS products. It's the users who say "It Costs Less To Own The Best."

Send for bulletin describing
KVS Kilns, Coolers & Dryers

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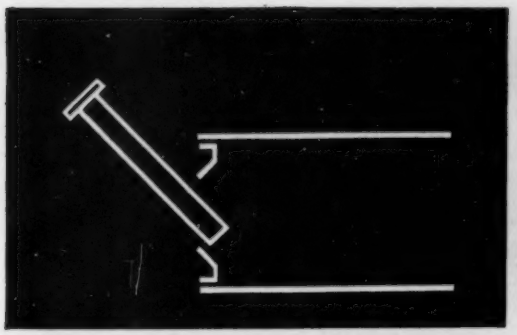
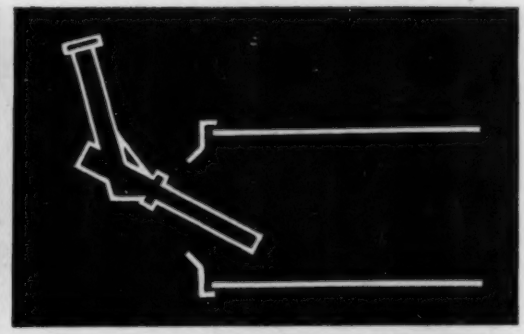
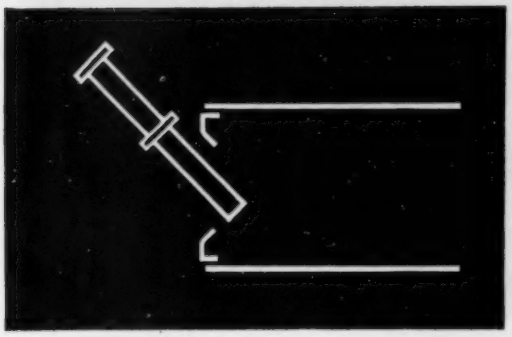
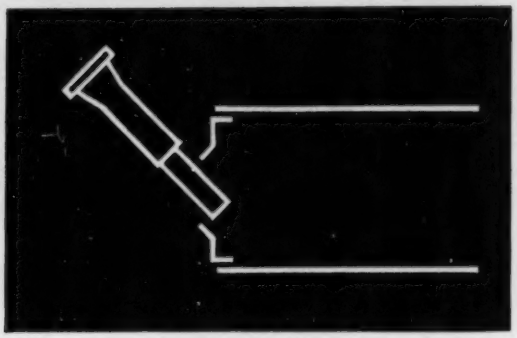
TWO PARK AVENUE, NEW YORK 16, N. Y.









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Thermalloy "40" kiln feed end of segmented cone design.

Thermalloy "50" feed pipe section flanged on each end.

Thermalloy feed pipe assembly of unique "angled" design.

The diagrams above show some of the many ways in which Thermalloy feed ends and feed pipes can be adapted to your kiln requirements.

No special "built-up" brick feed ends are necessary, thus reducing installation costs. The segmental design of Thermalloy feed ends prevents cracking due to expansion and contraction. And Thermalloy feed ends have lasted up to *10 times as long* as "bricked-up" ends.

With the many different designs of Thermalloy feed pipes and feed ends available, an Electro-Alloys engineer can help you choose the type best adapted to your requirements—for easiest installation and maximum service life

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*Reg. U. S. Pat. Off.

Specify THERMALLOY* for heat and abrasion resistance ... CHEMALLOY* for corrosion resistance

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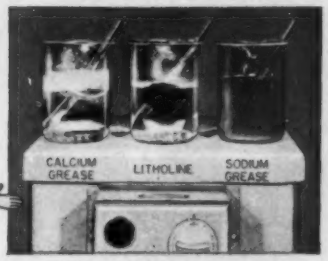
"Yes—One Grease, One Gun and A Better Job too!"

Here is a versatile grease that can be used with absolute confidence *wherever* lubrication is needed—chassis, wheel bearings, water pumps, universal joints, etc., in winter or summer—under *all* kinds of operating conditions.

These 4 Severe tests prove SINCLAIR LITHOLINE is better than any single grease!

SCENE: Sinclair's Research Laboratories, Harvey, Ill.

CAST: Two commonly-used greases of highest quality; a calcium soap chassis lubricant and a sodium soap wheel bearing grease; and Sinclair's Litholine.



WATER RESISTANCE TEST!

Samples of each grease are heated in beakers of water. Near boiling, the sodium grease disintegrates into soapy water and oil. Shortly after boiling the calcium grease shows foamy emulsion as grease absorbs excess water. Litholine remains unaffected, proves its superiority in combating wet conditions.

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Lubrication Jobs!

LOOK WHAT ONE-GREASE—ONE-GUN LUBRICATION MEANS TO YOU...

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3. Less chance for contamination
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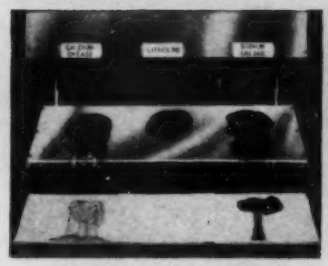
10. A finer grease at every lubrication point

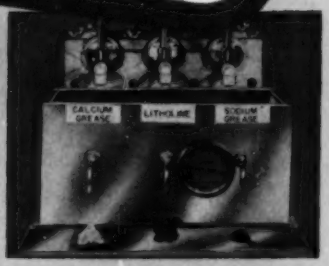


HEAT-RESISTANCE TEST!

The samples are heated on a plate. At 190°F., the calcium grease disintegrates. At 340-350°F., the sodium soap structure collapses and releases the oil. Bearing failures would follow. At 380°F., Litholine shows no effects, proves superior for high temperature lubrication jobs.

MECHANICAL STABILITY TEST!

Worked (kneaded) samples are placed beside samples of unworked grease. Steel balls are dropped. Distance ball sinks in worked samples shows increase in softness—loss of stability. The calcium grease showed greatest increase in penetration, the sodium grease next. Litholine showed no difference whatever . . . proving its superior mechanical stability in service.

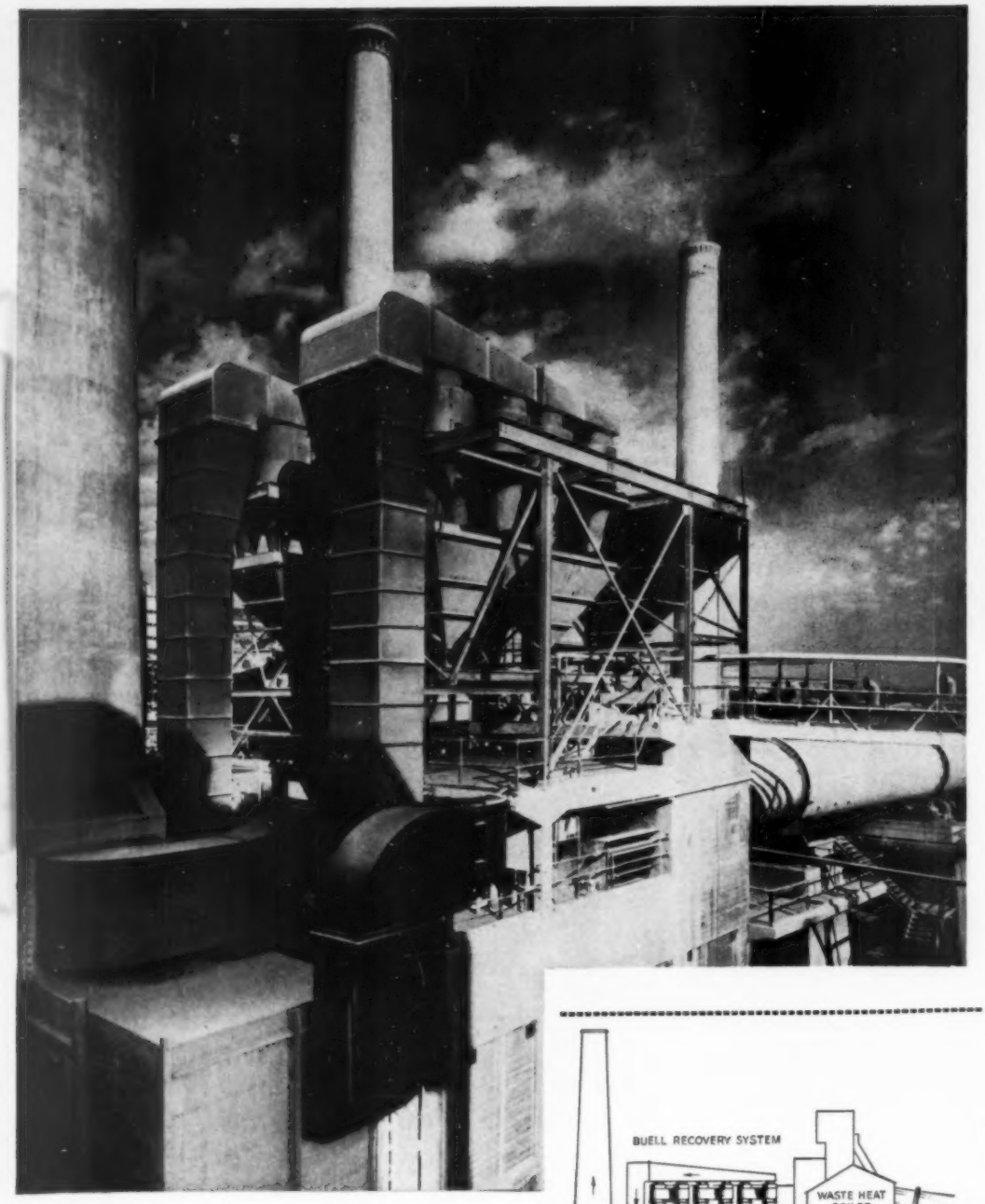


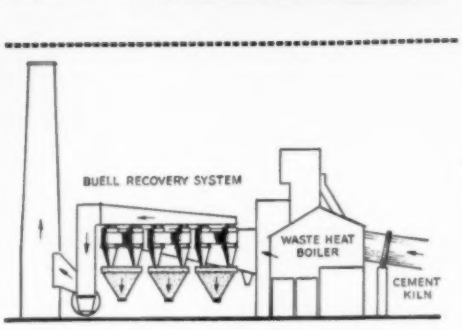
LOW TEMPERATURE PUMPABILITY TEST! Lever-type grease guns are filled with chassis greases and cooled. At 20°F., it is impossible to pump the sodium grease. At 0°F., it is impossible to pump the calcium grease. But Litholine still pumps in good volume! Yet Litholine is a heavier (harder) grease. Thus, Litholine has the body for summer service yet is pumpable in severely low temperatures.

COMPANY

For lubrication counsel, or more information on Litholine, see your nearest Supplier of Sinclair Products, or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, New York.

In Cement and Lime Kiln





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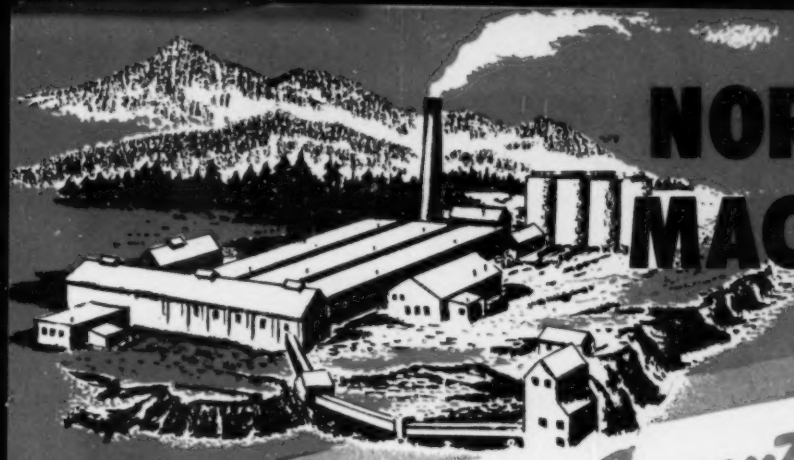

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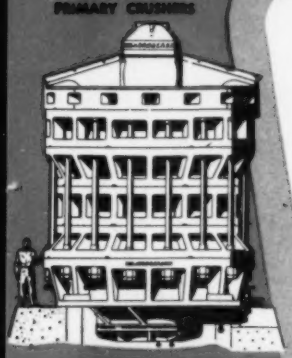
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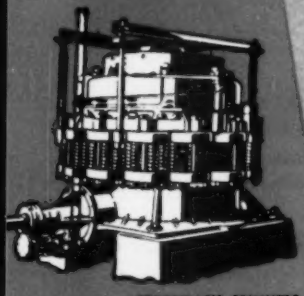
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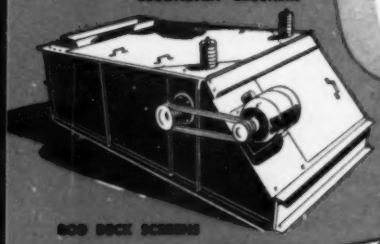
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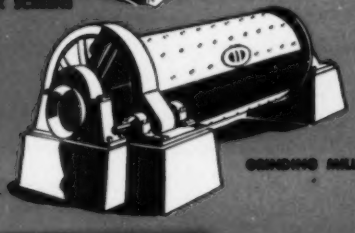
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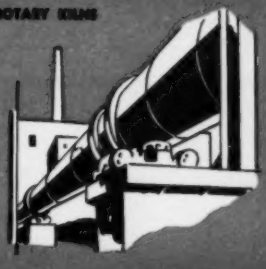
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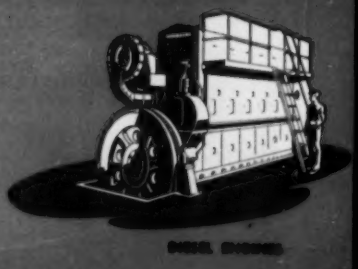
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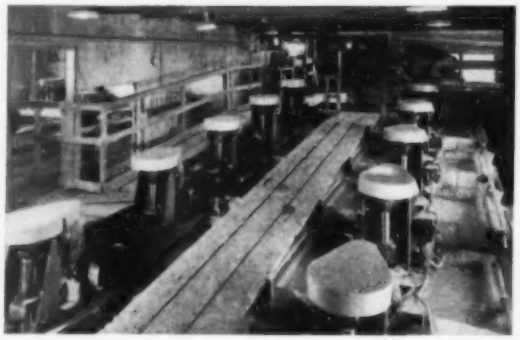

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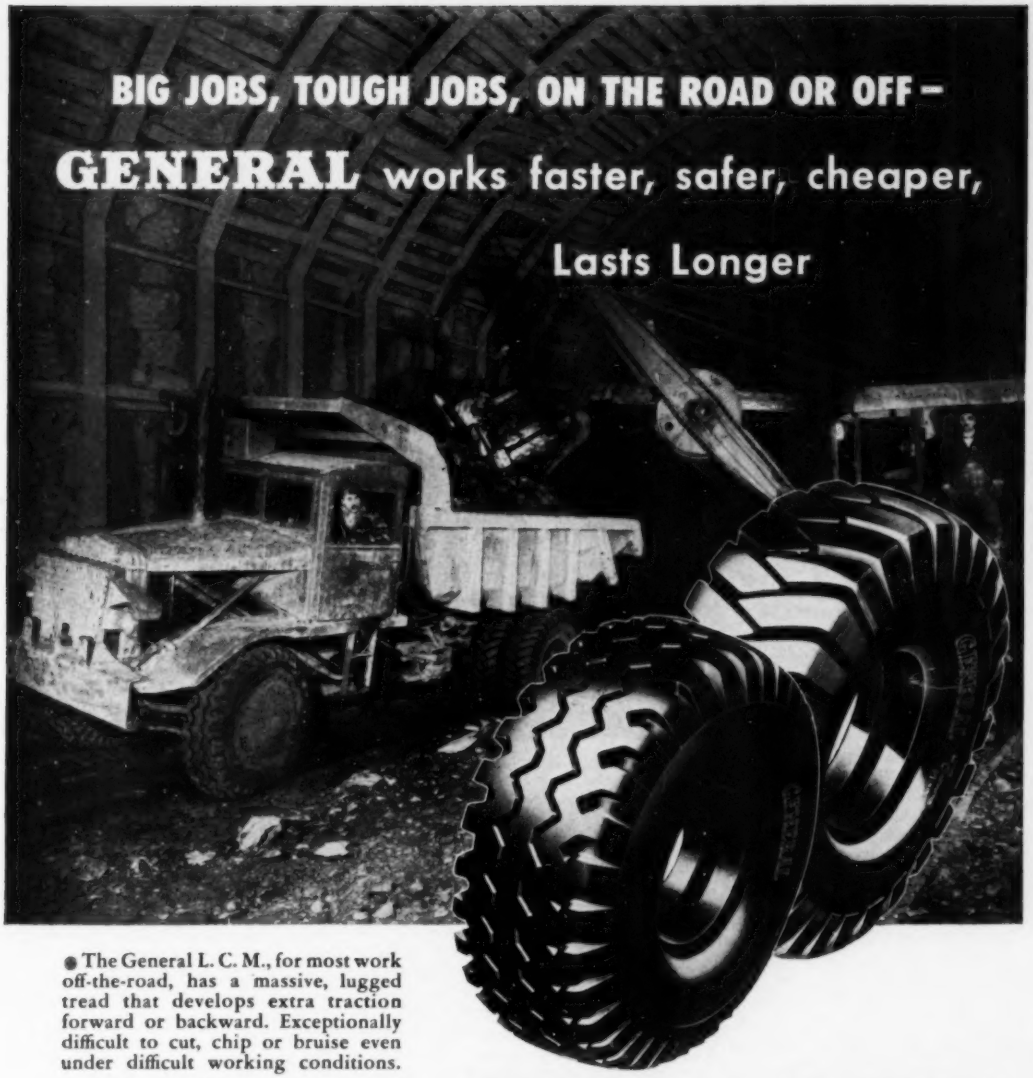

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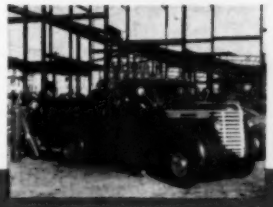

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Canadian Mining Institute Meets At Toronto for 52nd Convention

THE Canadian Institute of Mining and Metallurgy held its 52nd Annual Meeting in the Royal York Hotel, Toronto, from April 17 to 19. With over 1500 persons registered and all of the 25 technical sessions and various other functions very well attended, it goes down in the records as one of the best meetings that the institute ever held. A new division, the Petroleum and Natural Gas Division, held its first session at this convention. This brings to six the number of divisions of the Institute, the others being Industrial Minerals, Geology, Metal Mining, Coal, and Metallurgy.

Dr. A. O. Dufresne, deputy minister of mines for the province of Quebec, was elected president for the coming year, succeeding F. V. Seibert of Winnipeg. It was announced that the next annual meeting would be in the City of Quebec in March or April, 1951.

George F. Jenkins, general manager of Asbestos Corporation, Limited, was elected chairman of the Industrial Minerals Division for the coming year and Paul Bourret of the Quebec Department of Mines was elected secretary-treasurer. This Division under the leadership of J. H. Robinson (Gypsum Lime & Alabastine, Canada, Limited) chairman, and D. F. Hewitt (Ontario Department of Mines) secretary-treasurer, had a very active year and presented a very interesting program of technical papers at the meeting. The Division also arranged through the courtesy of Canadian Johns-Manville for its members to visit the new Transite pipe and rock wool plants of that company at Port Union near Toronto, an opportunity that was appreciated by many. Brief summaries of the papers presented at the technical sessions of this division follow.

Recent Developments in Shaft Lime Kilns was the subject of a paper by M. F. Parsons of Gypsum, Lime & Alabastine, Canada, Limited, in which the performance of the large, modern vertical shaft kilns at the Beachville, Ontario, plant of this company was discussed. Four of these kilns, he said, have averaged 72 tons of high-calcium lime per kiln per day over a period of a year, with actual daily production of 75 to 80 tons. The fuel ratio over the period of a year was 5.2 tons of lime per ton of 14,000 B.t.u. coal, and the production in terms of shaft area was 2800

George F. Jenkins (Asbestos Corp., Ltd.) was elected chairman of the Industrial Minerals Division.

lb. per sq. ft. per day, as compared with about 500 lbs. per sq. ft. of shaft area which, he said, is normally considered a satisfactory performance. He gave the credit for the development of these kilns to their present high state of efficiency to J. H. Robinson, general superintendent of the company. The kilns have the central flue type of burner and are fired with producer gas blown with a mixture of air and CO_2 gas recovered from the kiln exhaust fans. This, as Mr. Parsons pointed out, is a departure from the usual practice of blowing the producer gas with air and steam. The CO_2 prevents clinker formation in the producers, but has no effect in raising the B.t.u. content of the gas. Stone is sized from 6 to 10 in. and from 4 to 6 in. for burning, and the kilns are operated under a draft of 4 to 5 in. of water gauge. Drawing is done at 45-minute intervals which, Mr. Parsons explained, has been found to be the closest approach to continuous draw practicable with stone sizes larger than 4 in. The highest operating efficiency, he claimed, is obtained when the kilns are being forced, rather than when running at medium capacity. He ascribed this to the higher temperatures employed.

Some information was also given on a new kiln at this plant designed to burn stone from 2 to 4 in. in size. This kiln is already producing 150 tons of lime per day, or 3300 lbs. per sq. ft. of shaft area per day when being operated at a top draft of 11 in. of water. In conclusion, Mr. Parsons stated that the results already obtained at the Beachville plant indicated that shaft kiln capacities of over 3500 lbs. per sq. ft. of shaft area per day are possible and that the operation will require less than 5,000,000 B.t.u.'s per ton of lime produced.

In a paper entitled *Blast Furnace Slag Cement* M. R. Foran, professor of industrial chemistry at the Nova Scotia Technical College, Halifax, N. S., and J. A. Brothers, research assistant, Nova Scotia Research Foundation, Halifax, gave the results of their investigations in the making of hydraulic cement from the iron blast furnace slag of the Dominion Steel and Coal Company of Sydney, N. S., by grinding the granulated slag and mixing with it various other constituents. The influence of the chemical and mineralogical composition of the slag on the hydraulic properties of the cement, the conditions of granulation, the manner of drying, and the necessary fineness of grinding were discussed; the effects of the addition singly or in combination of lime, portland cement, and anhydrite were described; and many tables of data were presented.

The authors stated that their work has shown that a cement apparently equivalent to portland cement in every respect can be made from this blast furnace slag by adding certain quantities of portland cement as an activator. Their tests also showed that slag-anhydrite cement made from Sydney slag, to which was added a small quantity of portland cement, appears to be equal in every respect to similar cements made in Europe. They concluded that finenesses of grinding is the most important factor in determining the rate of set and strength development of slag cements.

M. F. Parsons (Gypsum, Lime & Alabastine, Canada, Ltd.) discussed recent developments in shaft lime kilns.

In his paper *Magnesia and Hydrated Lime from Wakefield Brucitic Limestone* Harry Jomini, manager of the Wakefield, Quebec, plant of the Aluminum Company of Canada, Limited, described in detail the processing of a brucite-bearing limestone to obtain magnesia, magnesia fertilizer ingredients, and hydrated lime. The plant, situated on the Gatineau river 22 miles north of Ottawa, has a fine safety record, having operated for more than 2½ years without a lost-time accident.

The process used, he said, was developed by M. F. Goudge of the Canadian Bureau of Mines. It involves the calcination of the limestone under carefully controlled conditions in rotary kilns, the dry hydration of the calcined products to convert the lime into the form of a dry hydrate while leaving the magnesia unaffected, the air separation of the magnesia and hydrated lime, and the washing and drying of the granular magnesia product. Mr. Jomini said that the hydrated lime is bagged and shipped for agricultural, chemical and construction uses. The magnesia is shipped either in bulk or bags for use in making basic refractory bricks and shapes, for the production of magnesium metal, for the making of magnesium oxysulphate and magnesium oxychloride cements, for the production of basic magnesium carbonate, and for use as a fertilizer material in the growing of potatoes, apples and citrus fruits. It is also employed as an ingredient of mixed fertilizers for use in areas where the soil is deficient in magnesium. Mr. Jomini pointed out the possibility of making pure magnesium chemicals for use in various industries after further research at the Wakefield plant.

The Kilmar Magnesite Mine and Heavy-Media Separation Plant was the title of a paper by W. T. Bray, mine manager for Canadian Refractories, Limited, Kilmar, Quebec. This company produces basic refractories used by the metallurgical industry. The chief raw material is the dolomitic magnesite which is mined at Kilmar and beneficiated in a heavy-media separation plant before being ground and dead-burned in a rotary kiln in order to obtain a clinker which is made into brick and cement.

Mr. Bray described both the mine and the plant and explained how the use of heavy-media separation to separate siliceous material from the ores has permitted desirable changes in mining practice, and how it has increased ore reserves and improved the control of the chemical composition of the kiln feed. He said that the use of the heavy-media separation plant permits more economical stopping methods to be used; moreover, high-silica orebodies can be mined and more nearly complete extraction can be had in all ore bodies.

The heavy-media separation process employed, he said, was that of the American Cyanamid Company which uses 85 percent ferro silicon of "100 grind." He stated that the 14-ft. cone was rated at 20 t.p.h. of feed, but is being satisfactorily operated at 30 t.p.h.

M. S. Badollet of Johns-Manville Corporation, Manville, N. J., presented another of his series of papers on asbestos research. This was entitled *Processing Asbestos Fibers: Effects Upon Physical Properties.* Mr. Badollet presented the results of research on the effects of reprocessing various types of asbestos fibers used in industry in order to meet specifications for strength, length, density, buoyancy, surface area, and, in some cases, rate of filtration. Generally the fiber as received, he said, requires some reprocessing before it can be used to best advantage, but this re-processing, in which it is passed through a willowing machine, produces changes in physical properties; and it is necessary to understand what will probably happen to the fiber in order not to destroy its usefulness. Soft chrysotile fiber retains its properties under repeated willowing, he said, whereas harsh chrysotile fiber breaks up but does not dust, and it retains its fast filtering characteristics. Recommendations were made as to the treatment to be given to each type of commercial fiber.

J. H. Robinson (Gypsum, Lime & Alabastine, Canada, Ltd.) credited with the present efficient performance of his company's kilns.

In his paper *Conversion to Truck Haulage at Asbestos Corporation's British Canadian Mine* Lionel C. Piuze, superintendent of that property, which is one of the four operating properties of Asbestos Corporation in the Quebec asbestos-producing district, described the benefits that accrued following the changeover in methods. Previously, he said, the ore was hauled in 6-ton, steel-lined, side-dump cars in trains of eight by 13-ton electric locomotives. The average distance from the loading points to the crusher was 3,000 ft., of which 1,200 ft. was on a 6.5 percent incline in favor of the load. Loading was done by two-cu. yd. electric shovels.

The decision to change to truck haulage, he said, was made after a study of this mode of haulage at open-pit iron mines, and coincident with a decision to increase production from 3,000 to 6,000 tons per day. To make the changeover, the old equipment was completely replaced. Eight diesel-powered, end-dump Euclid trucks with quarry-type bodies holding 24½ tons replaced the electric trains. At the same time a 4-cu. yd. electric shovel was bought to replace the two 2-cu. yd. electric shovels previously used. The new shovel, said Mr. Piuze, loads a truck in 1½ to 2 minutes, as compared with 6 minutes for the smaller shovel. A 50-ft.

utes for the smaller shovel. A 50-ft. roadway of the same length as the railway was built for the trucks. The following figures were given as showing the comparison between rail and truck transportation costs after a year of truck operations:

	Truck (1949)	*Rail (1948)*
Tonnage hauled	1,161,686	1,023,764
Maintenance of roadway	$0.0096	$0.0358
Maintenance of rolling stock	$0.0232	$0.0568
Wages of transportation crews	$0,183	$0.0945
Wages of dumpers	$0.0046	$0.0067
Power or Fuel	$0.0062	$0.0049
Total	$0.0619	$0.1987

Depreciation carried over a five-year period would, he said, raise the cost per ton to $0.1022 for trucks and $0.2247 for rail. This shows a reduction in transportation costs of 54.4 percent, and in addition the use of trucks is partly responsible for a reduction of 37.6 percent in the cost of loading, because (1) no tracks have to be laid, moved or repaired; (2) shunting is eliminated; (3) trucks allow much more flexibility in the loading operations; and (4) trucks can be spotted at the most convenient loading position for the shovel operator.

In conclusion, Mr. Piuze stated that after a year's experience with truck haulage it is found that successful operation depends on (1) loading all units to capacity; (2) keeping haulageways, loading points, and dumping areas well drained and clear of all debris; (3) having two spare trucks available for every five in operation; and (4) keeping close supervision over tire care and maintenance.

In *Chrysotile Asbestos in Munro and Beatty Townships, Ontario* N. W. Hendry, chief geologist, Canadian Johns-Manville Co., Limited, gave the first detailed account of one of the major mineral finds of recent years in Canada, namely, the great asbestos find near Matheson in Northern Ontario. Although the asbestos-bearing outcrops were known to occur in this area since 1914, their potential importance was not recognized until the deposit was visited by one of the engineers of the asbestos producing company. An active program of diamond drilling was started on March 25, 1949, and the first hole was drilled to a vertical depth of 784 feet in one of excellent grade. To date, stated Mr. Hendry, some 65,800 ft. of diamond drilling has outlined asbestos zones of commercial interest, many hundreds of feet in length, width and depth, along a 2-mile length of serpentine, and the largest ore body, known as "A" ore body, has not yet been bottomed.

Excavations for a mill handling 2,400 tons per day were begun in September, 1949. The first unit of this mill, handling 50 tons per hour, went into operation on March 27, 1950, just two days over one year from the date that the No. 1 diamond drill hole was collared, which is a real achievement.

The asbestos, Mr. Hendry stated, occurs in cross-fiber veins 1/32 inch to 1 inch wide and is of a harsh grade of considerable strength. Mining is to be by open pit, with benches of 35 ft. Eventually "A" pit will be 2,200 ft. long by 800 ft. wide, rim to rim, he stated. The rock is loaded by 2½-cu. yd. diesel shovels into 15-ton trucks for transportation to the mill, where the fiber is extracted, graded, and bagged. It is then transported in 13-ton tractor trailers to a warehouse in Matheson for shipment to various Johns-Manville manufacturing plants in Canada and the United States.

N.L.A. Convention

(*From page 82*)

American economic system has changed the ways of the world, and it is worth keeping and improving. The growing concentration of power will kill all this, he warned, and we should not accept it as a trend. He described the three types of people who want socialism: (1) the Communists, who want to wreck our economy by all possible means; (2) the types of labor leaders who spread false propaganda against business in order to maintain their own positions, although most of them actually want to keep our free enterprise system; (3) the social planners in high places in government, who are constantly devising new socialistic schemes and means of foisting them on us. The latter group he further divided into three sub-groups: the idealists, who think they are doing it for our own good; the experimentalists, who instead of correcting the defects in our present system, want to wreck the whole thing; and the bigger and better job boys, who want more power and more money to spend. These men, Mr. Booth pointed out, have good jobs for which we pay, and they devote their lives to advancing socialism. The attitude of the people who want something for nothing encourages them, and in return they promise security—at no cost except higher taxes and the loss of personal freedom.

Mr. Booth briefly described some of the many schemes which are being pushed to bring in socialism and urged that we combat all of them. We must know first how a free economy works and refresh our knowledge of its basic principles. We must make no demands on government for things we can do for ourselves. We must be active politically, as the government belongs to those most actively interested in it. We must make our own political views known and must vote and help get out the vote. We must explain our business to our employees and the public, to counteract those who criticize business and our economic system. In other words, we must put truth into action.

The 45-foot "Ann", powered with two Cummins marine diesels, is doing the work of two gasoline tugs for the Fred R. McKenzie Sand and Gravel Company of Galesburg, Ill. McKenzie is using the boat in his Fulton, Ill., quarry, where he reports very economical fuel consumption. The "Ann" is a twin-screw vessel powered with two 165-hp. Cummins HR-600 diesels.

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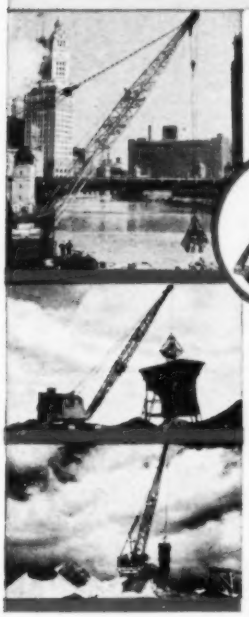

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Develop Ductile Cast Iron With Advantages of Steel

Industry now has available to it a new cast iron which, unlike ordinary cast iron, is not brittle but can be bent or twisted. This new material can be made readily and economically and can be used in many applications, thus affording countless economies throughout the industrial world. It is probably one of the outstanding metallurgical developments in the foundry industry since around 1820 when Seth Boyden first made, from cast iron, the American type of malleable iron at Newark, N. J. The novel product, popularly known as ductile cast iron, has several times greater strength than ordinary cast iron with greatly increased ductility and shock-resistance.

These facts were presented before the annual meeting of the Gray Iron Founders' Society, held at Chicago. Patents covering the new material are held by the International Nickel Company.

The new ductile cast iron is said to combine processing advantages of cast iron, such as fluidity, castability and machinability, with many of the product advantages of steel. The essential feature of the inventions is the introduction into, and retention by the molten iron under treatment, of a small but effective amount of magnesium. The presence of critical amounts of magnesium in the cast iron produces a new graphite structure which is in the form of spheroids or compacted particles. Due to the elimination of a substantial amount of the usual weakening flake graphite, the new magnesium-treated cast iron possesses excellent engineering properties, particularly high tensile strength.

Mines Bureau Circular Tells Of Pyrophyllite Flotation

Pyrophyllite, a mineral resembling talc and used for the same purposes in ceramic, paint, paper and other industries, can be freed almost completely from the quartz with which it is found, according to a report from the U. S. Bureau of Mines.

Pyrophyllite has been mined in North Carolina and marketed without treatment for a century. That now on the market contains from 10 to 50 percent of impurities, mainly quartz. For some uses, these do no harm. For others, however, such as a carrier in insecticide powders, the abrasive quality of the contained quartz is objectionable.

Because of the developing demand for a higher-grade product, the Bureau made flotation tests on a sample of North Carolina ore. As described in the report, the tests showed that pyrophyllite can be separated from quartz easily with the aid of a number of reagents.

A free copy of Report of Investigations 4674, Flotation of a North Carolina Pyrophyllite Ore, by Frank D. Lamb and John Ruppert, can be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

Modern Portland Cement Plant Practice*

By J. M. WOLFE
Engineer Allis-Chalmers Mfg. Co.
Milwaukee 1, Wis.

THE discovery of portland cement, first known in England, is attributed to Joseph Aspdin, a bricklayer, who took out a patent in 1824 for an improved cement which he called "Portland Cement" because it resembled the building stone quarried on the Isle of Portland.

Aspdin's cement was the lightly calcined product of a mixture of lime and clay taken in definite and predetermined proportion. John Smeaton, an English civil engineer, had experimented in 1756 with hydraulic limes which he produced by lightly burning an impure or argillaceous limestone. Later, in 1796, another Englishman, Joseph Parker, produced the first hydraulic cement, which he called "Roman Cement." This was prepared by burning, with a heat nearly sufficient to vitrify them, concretions or nodules of clay containing calcareous matter and reducing the burned stone to powder.

At the beginnig of the 19th century it was recognized that burning the proportioned raw material mixture at high temperature to a state of partial fusion would produce a superior cement, but technology had not progressed sufficiently to grind the resulting hard burned clinker economically. Consequently, during the first half of the 19th century in England, most of the cement used was produced by calcining imperfectly a controlled mixture of chalk or limestone and clay. It was not until about 1850 that cement manufacturers began to burn raw mixtures to complete decarbonization and incipient vitrification. By that time machinery had been developed to grind hard clinker. In the intervening years the methods devised for the control of raw material mixtures have so greatly improved that in the modern plant the chemical composition can be held to optimum limits.

The earliest production in the United States dated from 1871, when David O. Saylor of Allentown, Pa., filed a patent for an "improved cement." Saylor found that the chemical composition of certain argillaceous limestones in the Lehigh Valley closely approached the analysis of raw mixtures that were used in the manufacture of Belgian and English cements, which were then being imported.

The early manufacture of portland cement in the United States employed methods then current in Europe, where fuel cost was high but labor was cheap. Moreover, in the United States, fuel was abundant and comparatively inexpensive and labor was much higher than in Europe. About 1880 the high cost of labor increased the price of domestic cement to the level at which imported cement could be sold.

A large amount of the labor employed in the process of manufacture was engaged in preparing and burning raw materials. After grinding, the wet mixture was molded into bricks, which were allowed to dry. Manual labor was employed to charge these bricks into the intermittent dome kilns that were used in the 1880's. The bricks were charged into the kiln with alternate layers of coke and the kiln was then fired. Dome kilns had a rated capacity of from 15 to 30 bbls. of clinker per day. Additional labor was required to withdraw the clinker, which was generally poorly or unevenly burned and required hand sorting.

The essential features of the dome kiln were later improved to eliminate the periodic charging and discharging; and, as a continuous production unit, it was called a shaft kiln. With continuity of operations, some reduction in labor cost was effected, but capacity was low, and the preparatory operations remained the same while clinker quality continued to be inferior.

The industry's attempts to solve the problem created by competition with the lower-priced imported product led to the adoption of the rotary kiln. This machine had been invented in England in 1873 by Frederick Ransome and patented in 1885. Failure to realize the expected advantages of the rotary kiln on account of technical difficulties delayed its adoption in England until after it had been applied successfully in the United States.

The first successful installation was completed in 1890. It comprised a 2-ft. 6-in. dia. by 18-ft. long rotary kiln, which was installed by the Atlas Cement Company at Coplay, Pa. During the initial trial operations of the rotary kilns results had not been promising as the feed was too large, consisting of crushed material reduced to minus 2-in. in size. Later the cement rock was finely ground and the proportioning of lime and silica was accurately controlled. The product was burned thoroughly to uniform quality. Crude oil was used as fuel to burn the clinker, a great improvement over producer gas, which was used in the early English experiments.

The use of the rotary kiln eliminated the laborious steps of brick molding and drying in the preparation of the raw materials. The ground raw mixture could be fed directly to the kiln in the dry state or as a wet slurry. Moreover, the amount of labor required to operate the rotary kiln was very small, compared to that needed for the shaft kiln. The unit cost of production was further greatly reduced by the large increase in clinker production of the rotary kiln. The quality of the clinker produced was also much improved, which was an important factor in promoting acceptability of the domestic product in competition with the well established European brands of cement.

The change in the equipment and technique in clinker burning has been marked by increased length and capacity of the rotary kiln and the use of much accessory equipment, which has improved kiln operation and performance. Other departments of the plant also underwent mechanization to keep pace with the expanded output of the rotary kiln and the increased demand for cement. Slow hand methods in the quarry gradually disappeared as pneumatic drills, mechanical shovels, and locomotives appeared. These mechanical developments introduced jaw and gyratory crushers adequate for the requirements of mechanized quarrying and loading; and cylindrical type grinding mills replaced the older buhr mills for fine grinding.

From 1900 to 1920 machines rapidly replaced manual methods to provide a high productional output and continuous flow of materials.

*This is a condensation of technical paper No. 88, *Modern Portland Cement Plant Practice* by F. T. Agathe, E. H. Baxa, and J. M. Wolfe, Allis-Chalmers Mfg. Co., Milwaukee, Wis., which was presented at the First Pan-American Engineering Congress, held in Rio de Janeiro, Brazil, from July 14 to 25, 1949.

Emphasis was placed on expanding production to meet the demand for cement that was sustained by the growing activities in the field of construction. In 1880, 42,000 bbls. of portland cement was produced in the United States; in 1890, production was 335,000 bbls.; this increased to 8,500,000 bbls. in 1900; to 51,000,000 bbls. in 1908; and to 100,000,000 bbls. in 1920.

In 1928 production reached approximately 176,000,000 bbls., a figure that has since been exceeded only in 1942 and 1948. In 1942 output was 182,000,000 bbls., and in 1948 a record of 205,000,000 bbls. was reached. This represents a consumption of about 1.4 bbls. per capita, which is probably the highest per capita consumption of any country.

At the present time it is estimated that there are 163 cement plants in the United States, with a potential capacity of 240,000,000 bbls.

Latin America has 63 cement plants with a calculated total annual capacity of 40,000,000 bbls.

Methods

The manufacture of portland cement involves the economic conversion of calcareous and argillaceous materials into a substance having useful cementitious properties, which, when mixed with aggregates and water, produces the concrete used in modern construction.

The raw materials utilized are distributed widely throughout the earth's crust. The calcareous ingredient is commonly limestone, or it may be "cement rock" (an argillaceous limestone), oyster shells, marl or chalk. The argillaceous element is supplied by clay, shale, or granulated blast-furnace slag. There are four plants operating in the United States that employ a raw mixture consisting of blast furnace slag and limestone. These plants are located usually close to steel-producing centers, where blast furnace slag is readily available as a cheap waste product.

For the production of special cements, or where it is necessary to modify slightly the chemical composition of the raw mixture, one or more minerals in minor quantities may be added. These are bauxite, diapore, silica sand, and iron ore. The raw mixture may comprise as many as three or four ingredients.

There are two distinct processes employed in the manufacture of portland cement: namely, the dry process and the wet process. The type of process adopted for a cement plant proposed for a given location depends upon many technical and economic factors which must be analyzed before the selection is made. The wet process may be dictated by raw materials which are wet in their natural state; or the lack of a sufficient water supply may inhibit the use of the wet process.

In the dry process any moisture contained in the raw materials is reduced in rotary dryers to approximately one percent before grinding. The proportioned raw materials are then ground in the dry state to the desired fineness, and the resulting pulverulent mixture is placed in silos where further correction of the chemical composition is made, if necessary.

In the wet process water is added to the proportioned raw mix as it is fed to the grinding mills. Further processing of the raw materials prior to burning consists of blending, correcting, and controlling the finely divided raw materials suspended in water. The mixture of the finely ground raw materials with sufficient water to produce fluidity is called slurry.

The raw materials are carefully proportioned and ground to such fineness that about 90 percent will pass through a 200-mesh screen. Two systems of grinding are employed: namely, open and closed circuit. In open circuit grinding the material makes one pass through the mill, from which it is discharged at the desired fineness.

Wet and dry closed circuit grinding, which are modern developments, permit the close control of particle size, an important factor in the quality of the cement. In closed circuit grinding the mill discharge passes through a mechanical classifier or air separator which makes an oversize fraction that is returned to the mill for regrinding. The fines from the classifier or separator constitute the finished product.

Dry pulverized raw mixtures are blended by intermixing, by recirculation, by agitation, or by "fluidization". Fluidizing is produced by the admission of air through porous plates in the bottom of cylindrical tanks or silos.

In the wet process the raw material slurry will contain from 35 to 40 percent moisture as discharged from mills operating in open circuit. The slurry is pumped to large basins or tanks in which final proportioning to close limits is attained.

The chemical composition of the wet slurry is adjusted as necessary by intermixing, blending, or correction, and is maintained in a homogeneous state by agitation in large storage tanks from which the final mixture is withdrawn for feeding the kilns.

When wet closed circuit raw grinding is practiced, the classifier overflow contains from 85 to 90 percent water which is decreased in thickeners. The thickener underflow product is slurry of normal 35 to 40 percent water content which is pumped to the blending department. The excess water which overflows the thickener is re-used in the grinding circuit.

Most cement plants built in the United States between 1900 and 1920 were designed for the dry process. However, after 1920 a trend began toward the wet process which is evidenced by the fact that 49 of the 53 plants built between 1921 and 1933 use this process.

The increased interest in the wet process was stimulated by competitive pressure to improve the quality of the product. This is accomplished by more precise control of the chemical composition and homogeneity of the raw mixture. The wet process facilitates accurate blending and correction of the raw mixture within very close limits, and is considered superior to the dry process from this standpoint.

The accuracy and uniformity of the composition of dry raw mixtures has improved notably during the past two decades due to refined proportioning feeders at grinding mills and new and ingenious equipment for blending systems. These developments have resulted in renewed interest in the dry process, which is spurred by rising fuel costs.

In both methods of manufacture in the United States, the raw mixture is burned to cement clinker in rotary kilns.

The clinker leaves the kiln at approximately 2200 deg. F. and enters a cooler. During the past two decades the air-quenching type of cooler, which functions as a heat recuperator, has become popular. Previously, rotary coolers, in which cooling was effected by showering clinker through an induced stream of air, were used almost exclusively; but the necessity for better heat utilization brought about the development of the air-quenching type.

After cooling, the clinker may be stored or passed directly to grinding mills. Modern clinker grinding circuits consist of multiple-compartment mills, or combinations of ball mills and/or multi-compartment mills operating in closed circuit with air separators.

Finished cement is stored in silos from which it is withdrawn for shipment in bulk or for packing and shipment in sacks. In 1946, 29.8 percent of the total cement shipments was in bulk, and 70.2 percent in bags. The latest storage silos and packhouse installations are designed to handle and pack several types of cement simultaneously in different packing machines. Dust collectors assist in keeping the packhouse clean and relatively dust-free.

The design of a modern wet process kiln-cooler unit, showing points of control and the instrumentation, the heat recuperating chain system, and the enlarged zone of the kiln, is shown below.

The quality of clinker and the heat expended per unit of production depends on the control of the important factors of operation of the rotary kiln. These factors are feed-rate, kiln speed, draft, and control of firing. When these factors are balanced properly for any given productional output, the kiln should be functioning efficiently. The facilities for regulating kiln operations are centralized in the kiln control board.

A graphic heat balance of the wet process rotary kiln and air-quenching cooler mentioned above, appears on page 178. This heat flow diagram shows how the heat generated by the combustion of the fuel is utilized in doing work in the kiln and the distribution of the remaining heat which is lost in various ways. The evaporation of the water in the slurry consumes the major portion of heat supplied to the kiln. The net thermal efficiency of the kiln as determined by the heat balance is in the order of 28.5 percent.

Trends

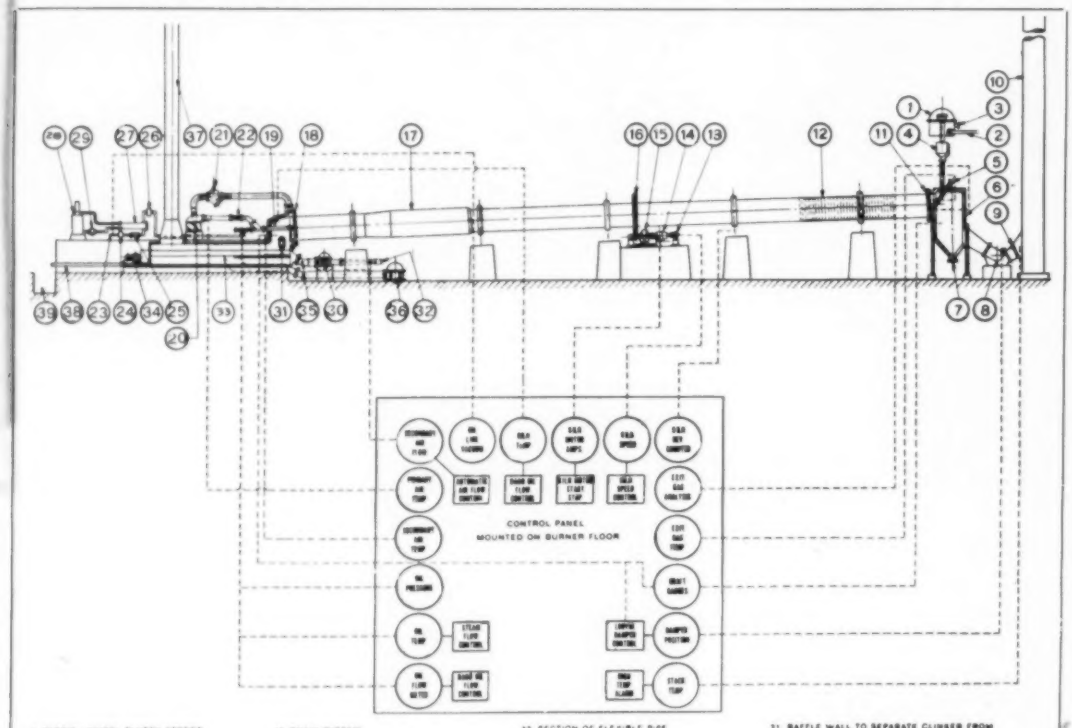
The two most important items of cost in the manufacture of a barrel of cement are labor and fuel. Cement plants are constantly striving to reduce these costs by efficient operation. The electrical energy consumed in the process represents the third item of cost in order of importance.

During the decade of 1890 to 1900 the portland cement industry in the United States adopted the rotary kiln. Its use sharply reduced the cost of labor for preparing and handling the raw mixture which the dome and shaft kilns required. The early 60-ft. long rotary kilns, which were originally fired with petroleum, utilized heat inefficiently. One of the first attempts to decrease fuel cost was the development in 1902 of a system for burning pulverized coal, which was cheaper than crude oil.

Subsequently fuel efficiency was improved by feeding the kiln with dry raw mixture, *i.e.*, utilizing the dry process and by using moderately

(*Continued on page* 178)

• Sectional view of a modern wet-process rotary kiln and air quenching clinker cooler unit, showing accessory equipment and a diagram of instrumentation.


CONTROL PANEL
MOUNTED ON BURNER FLOOR
1. FERRIS—WHEEL SLURRY FEEDER
2. SLURRY INLET
3. SLURRY OVERFLOW FROM FEEDER
4. SLURRY MEASURING POT FOR CALIBRATING SLURRY FEEDER
5. SLURRY FEED CHUTE
6. DUST CHAMBER
7. DUST HOPPER DISCHARGE
8. EXHAUST FAN
9. LOUVRE DAMPER FOR DRAFT CONTROL
10. EXIT GAS STACK
11. FEED END AIR SEAL
12. CHAIN SYSTEM
13. A.C. GENERATOR FOR SYNCHRONOUS TIE WITH SLURRY FEEDER
14. D.C. KILN DRIVE MOTOR
15. SPEED REDUCER
16. DRIVE GEAR
17. ENLARGED CALCINING ZONE
18. DISCHARGE END AIR SEAL
19. OIL BURNER BLAST PIPE
20. PRIMARY AIR FAN
21. AUTOMATIC TEMPERATURE CONTROL FOR PRIMARY AIR
22. SECTION OF FLEXIBLE PIPE
23. PIPE LINE FROM FUEL OIL SUPPLY
24. FUEL OIL FILTER
25. FUEL OIL PUMP
26. FUEL OIL METER
27. FUEL OIL PREHEATING HEAT EXCHANGER
28. STEAM BOILER TO FURNISH STEAM FOR PREHEATING OIL
29. BOILER FEEDWATER PUMP
30. SECONDARY AIR FAN
31. BAFFLE WALL TO SEPARATE CLINKER FROM SECONDARY AIR STREAM
32. VENTURI TUBE TO MEASURE SECONDARY AIR
33. RECIPROCATING GRATE OF AIR-QUENCHING CLINKER COOLER
34. RECIPROCATING GRATE DRIVE
35. COOLER GRATE AUTOMATIC SPEED CONTROL
36. FAN TO FURNISH AIR FOR FINAL COOLING OF CLINKER
37. COOLER WASTE HEAT STACK
38. CLINKER CONVEYOR
39. CLINKER PIT

More Information, Please

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. R-C. Pigments — Lime-Proof Colors for Cement and Stucco. Pocket-size color card for concrete masonry blocks. Reichard-Coulston, Inc.

2. Bulletin No. 1610 — Goyne Pumps and The Goyne Steam Pump Co. (4-page folder.) These bulletins present and describe Goyne pumps for circulating service in pumping sand, sludge, silt, tailings, ashes, and cement slurry. Bulletin 1610 contains information on the care and operation of these pumps. The folder includes a table of friction of water in pipes. The Goyne Steam Pump Co.

3. Rebuild Worn Tractor Parts with Manganal and The Manganal Marketer — How and Where to Use Manganal Products. The first is a vest-pocket booklet containing condensed data on Manganal (manganese-nickel steel) applicator bars and welding electrodes. The second contains two fliers in a folder. Sketches show how Manganal is applied. Sauls-Sickles Co.

4. Coal Handling Equipment. Bulletin No. 500. Contains descriptions of actual installations (illustrated) of Gifford-Wood equipment. Gifford-Wood Co.

5. Allis-Chalmers Large Direct Current Motors and Control for Heavy-Duty Drives. 40-page illustrated bulletin. Describes "frog-leg" armature windings, and mill-type spherical seated thrust bearings for heavy service. Allis-Chalmers Mfg. Co.

6. Power Saving Products. Covers gear speed reducers, motorized gear speed reducers, various types of gears, and flexible couplings. Each item is illustrated. D. O. James Gear Mfg. Co.

7. R-S Valves. Catalog No. 17. 48 pages. Covers such items as accessories; automatic controls; floor stand, hand lever, hand wheel, and liquid level control; metals used in R-S valves; prime movers; water supply control; and R-S valves by types. Illustrated with photographs, sketches, and diagrams. R-S Products Corp.

8. Hercules JDX. Flier describing an 11-in. mount hoist with the original "center-lift" principle. Specifications are included. Hercules Steel Products Corp.

9. Ni-Hard Cuts Cement Plant Costs and Engineering Properties and Applications of Ni-Hard. Former bulletin gives information on Ni-Hard for liners, concaves, pumps, balls, gudgeon bearings, etc. Latter (revised edition), containing many illustrations and tables, discusses engineering properties under the following topics — abrasion resistance, elevated temperatures, hardness, machining, strength, stress-relieving treatment, and welding. Service applications are considered under the following industry headings: cement, ceramic, coal and coke, construction, dredging, feed and food, industrial minerals, mining, power, etc. International Nickel Co., Inc.

10. A New Industry. An announcement of an automatic machine for producing Hydro-Forged Stone, developed in cooperation with and manufactured by The Baldwin Locomotive Works. Hydro-Forged Stone Associates, Inc.

11. Manganese and Alloy Steels for Cement Plant Equipment. 10-page bulletin featuring Kominuter grinding plates, ball and tube mill end liners, miscellaneous mill liners, ball, rod and tube mill screens, hammer and pulverizer mill parts, crusher parts, power shovel parts, conveyor parts, chains and sprockets, and anti-spill apron feeders. All are illustrated and described. Kensington Steel Co.

12. Technical Report No. 1000—Operating Range for Sharples Micromerograph, Type XA, and The Measurement of the Particle Size of Sub-Sieve Powders. The first describes the work of an instrument which determines the particle size distribution of a powdered material. The second is a reprint of a paper presented by R. E. Payne at the 3rd national conference of the American Instrument Society. The Sharples Corp.

13. Super-Duty Hypressure Jenny Steam Cleaner and Process Heat Generator. 4-page bulletin describing this dual-purpose device, giving dimensions, available models, optional equipment, and special features. Hypressure Jenny Division, Homestead Valve Mfg. Co.

14. The Agitamper Concrete Block Machine. 4-page bulletin containing the "story of the Agitamper", describing design, operation, and performance. Leslie C. Miller Supply, Inc.

15. Bulletin on the Sly Dust Filter. This folder presents a filter for the collection of cement dust at ready-mix operations. Includes sales and engineering data, information on installation, operation, and cost. The W. W. Sly Mfg. Co.

16. The Winslow Binnshatch, The Winslow Type "S" (Motor Truck Scale), and "Contractors' Special" Road Material Scale. The first (a 4-page bulletin, describes a portable combination bin and batcher furnished with two or three bins, a weigh hopper, and a batching scale. The second shows by means of a large drawing how the Type "S" truck scale is built and how it operates. The third describes the main features of the "Contractors' Special". All are illustrated. Winslow Government Standard Scale Works, Inc.

17. The Bradley Hercules Mill. Catalog No. 60. 20 pages. Full descriptions, photographs, sketches, specifications, and outstanding features of each model are given. Bradley Pulverizer Co.

18. Chemico P-A Gas Scrubbers. Bulletin M-102. The operation and performance of these scrubbers are described in detail. Illustrated with microphotographs, views of installations, cutaway views, etc. Chemical Construction Corp.

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41.				

NAME

TITLE

COMPANY

CITY

STATE

More Information, Please

19. Towmotor Runs Rings around Material Handling Problems. Folder showing typical applications for Towmotor equipment. Features on-the-job views, data on standard accessories, preventive maintenance, specified parts, desirable advantages, etc. Towmotor Corp.

20. Deco Trefoil (May and June, 1950) and flier on **Denver Forced Feed Jaw Crusher.** Flier lists important features, pictures and describes various models. Prices given for each size. Denver Equipment Co.

21. Economical Prospecting. 4-page bulletin presenting the Hossfeld direct motor drive rock drill. Pictures and explanatory text show why the drill is economical, simple in operation, compact, and fast. Typical uses are listed. Hossfeld Mfg. Co.

22. Maurey Multiple V-Drives. Bulletin No. MVD-1000. Fully describes the Maurey lines of Ful-Grip sheaves and Mor-Grip V-belts. Includes reference tables on both sheaves and V-belts. Maurey Mfg. Corp.

23. Haynes Alloys Hard-Facing Manual. A 40-page manual covering the following topics: what metals can be hard-faced; how to select the right rod; which welding process to use; how to make the deposit; properties of hard-facing alloys; typical industrial applications. Haynes Stellite Division, Union Carbide and Carbon Corp.

24. D-A Diesel Oil. Pocket folder describing how and why D-A diesel oil reduces engine deposits and neutralizes destructive combustion chamber acids. Discusses recently identified problems encountered with the appearance of fuels having a high-sulphur content. D-A Lubricant Co.

25. Convair Pneumatic Conveying Systems. Bulletin No. 103. Lists industries which may be served by these systems and contains sketches and explanatory text illustrating various setups. Convair Corp.

26. Dings Non-Electric Alnico Magnetic Perma-Drum. Catalog No. C-1100-A. 8-page catalog describing the application, operation, and design of the Dings separator. Design features of three models covered in this bulletin. Typical installation diagrams are shown, with recommendations. Dings Magnetic Separator Co.

27. Unit Crane News. Announces the new Unit 614 (¼-yd.), a new addition to the Unit Crane & Shovel line. Also describes the Unit 857 mobile crane in action. The various jobs this piece of equipment can perform are pictured and described. Unit Crane and Shovel Corp.

28. Wayne Monotrol Portable Continuous Mix Bituminous Plant. Fully describes the construction and advantages of the Monotrol (one-man control), its special features, and its performance. Specification sheet included. Wayne Crane Division, American Steel Dredge Co., Inc.

29. Hydro-Clone Sludge Tanks (Bulletin FY-166) and **Hydro-Clone Installations** (Bulletin FY-167). First describes the function and gives the dimensions for both manual and automatic sludge settling tanks. Second shows a variety of installations. Whiting Corp.

30. Bulletin R-217A. Describes the 11-S and 16-S Blue Brute concrete mixers. The 11-S is supplied either as a two-wheeler or a four-wheeler (11-cu. ft. capacity); the 16-S is a four-wheeler, 16-cu. ft. capacity mixer. Specifications for all models included. Worthington Pump & Machinery Corp.

31. Joy Electrical Connectors. Bulletin MC-106-2. Illustrates and describes the Joy standard line of molded neoprene rubber electrical connectors and related equipment. Mines Equipment Division, Joy Mfg. Co.

32. United Caravan Axles. Catalog 101. Contains sketches and photographs of "Titanic" hydraulic automatic brake control, "Caravan" two-wheel single-axle units, drop axle, four-wheel "Caravan" axles, steering mechanisms, drawbars, hand brake levers, spring-cushion hitch, under and side mount brackets, all-purpose running gear, and chassis landing gear. United Mfg. Co.

33. Smith Portable and Stationary Compressors and Accessories. Loose-leaf holder featuring the Model 70-P compressor, the Model 250, the Model 72-P, the Model 205-S stationary compressor, the Model 70-U industrial unit, the Model R-60 compressor, the Model 110-S (electric) stationary compressor, the Model 105-P compressor, and pneumatic tools and accessories. Specifications given for each. Gordon Smith & Co., Inc.

34. Catalog on Redi-Fab Series Belt Conveyors. 40 pages. A Redi-Fab conveyor layout sheet facilitates planning of layouts for the customer. Barber-Greene Co.

35. Murphy Diesel Dual-Fuel Engines. Full description of an engine which can be driven with either gas or diesel fuel. Special characteristics listed, design details pictured and described. Murphy Diesel Co.

36. The Carpenter Line. Illustrated vest-pocket folder presenting the Carpenter line of septic tank forms, distributing box forms, tank handling equipment, delivery rigs, etc. Specifications given for tanks. Carpenter Mfg. Co.

37. Studies in Centralized Lubrication. Case studies which bring out special advantages of using Farval systems of centralized lubrication. Economy, increased production and time saving features are explained. The Farval Corp.

38. Caterpillar Products. Contains illustrations and complete specifications on "Caterpillar" diesel tractors, motor graders, engines, bulldozers, scrapers, and hydraulic controls. Caterpillar Tractor Co.

39. Is Your Horsepower Going to the Track? and **How Long Is Your Tractor's Life Line?** Two fliers, the first featuring the International Harvester Company's crawler and the second track suspension. Each contains a keyed sketch to show the most important features. International Harvester Co.

40. IMO De Laval Herringbone Gear Reducers. Covers the following: specifications, standard types and sizes, selection, horsepower ratings, semi-high speed units, overhung loads, outboard bearings, dimensions and weights, flexible couplings, and worm gears. Illustrated with sketches and photographs. IMO-De Laval Products Division, De Laval Steam Turbine Co.

41. Victor Suprene — The All-Purpose Belt for All Industries. Four-page folder and price list describing the qualities of Suprene belting. Specification chart is included with the price list. Victor Balata & Textile Belting Co.

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Screenings

by William M. Avery

IN an excellent address presented at the dedication of the Portland Cement Association's research and development laboratories last month, Dr. A. Allan Bates uncorked a rhetorical haymaker that left us vaguely uneasy. "There are probably few among you," Dr. Bates said, "who are concerned with the extent to which nitrogen is isothermally absorbed on the submicroscopic internal surfaces of calcium silicate gels."

At that particular instant we were under dive-bombing attack by a squadron of man-eating mosquitoes, and the determination of absorption isotherms did not, somehow, matter a great deal to us. Now, however, we're not disposed to dismiss the matter quite so airily. Considered in retrospect, there's something definitely menacing about the absorption of nitrogen, and we would like, among other things, to know how long, and under whose auspices, it has been going on.

There may not, of course, be anything inherently subversive about this particular movement, but it is comforting to realize that sooner or later the entire matter is bound to fall under the eagle-eyed scrutiny of Senator McCarthy.

'Twon't Do

IN the amended Wage and Hour Law which became effective last January, the salary requirement for "executive" employees was increased from $30 a week to $55 a week, and for "administrative" or "professional" employees from $200 a month to $75 a week. If they keep on monkeying with the salary structure long enough, there's always a chance that some day executives will make as much as office boys, and then there'll be hell to pay.

Technological Unemployment

NOT long ago we received a news release from Allis-Chalmers telling about the production and safety records set in a South American gypsum mine as a result of using a modern tractor and scraper in place of the 250 burros formerly employed. What happened to the burros? "They were dismissed," states the release with cold finality, "and labor costs were greatly reduced."

No mention is made of the heartache and suffering which must in-

evitably result from the summary dismissal of 250 oatswinners, nor is there any indication that the blow was eased by severance pay, nor that efforts were made to find other suitable employment for the discharged workers. On the other hand, of course, we may just be stirring up a mare's nest among the burros.

Blimey!

"AUSTRALIA'S gold mines," says a terse clipping we received the other day, "are rapidly improving their sulphur output." Come now, lads. Let's keep our eyes on the ball!

Finance—High and Low

WE have it on good authority that a few months back the Administration weathered a pretty serious monetary crisis. Seems that around March 15th there was an unusually heavy influx of income-tax payments, and that for a few desperate days the government was actually in the embarrassing position of taking in more money than it was spending. We're happy to report that the Fair Dealers met the crisis head on, and quickly restored the normal relationship between receipts and disbursements. Bet somebody caught hell for napping at the pumps.

While we're on the subject of money, it should be noted that the Philadelphia Mint has closed down its coin-making operations for several months because of a reported decrease in demand. So far we've

had no response to our generous offer to accept the full output of the plant until the emergency has passed.

Turn About

WE understand that the Seward Fish and Cold Storage Company is involved in the establishment of a bulk cement plant at Seward, Alaska. Guess it's just as logical for fishermen to dabble in cement as it is for cement men to dabble in fish, but we do hope the Seward fellows enjoy better luck with their cement venture than some of the guys we know in the cement industry have with their fishing.

No Comparison

A FELLOW over in Indiana has filed a cross-complaint to his wife's divorce suit, asking the court to keep her from throwing rocks at his new car. Some people are never satisfied. Suppose, now, that she were *driving* the thing!

Cement Plant Practice

(*From page 174*)

longer kilns. Between 1915 and 1931 the waste-heat power plant, which utilized heat from the kiln exhaust gases, was the principal means of raising kiln efficiency. By 1931, 36 percent of the plants in the cement industry used waste-heat boilers, and after 1931 very long rotary kilns equipped with heat recuperating chain systems and other accessories became part of the modern cement plant.

The increased productivity of rotary kilns imposed a higher rate of operation in quarrying and crushing which as mentioned above, was met by mechanized drilling, loading, and transportation in the quarry, installation of belt conveyors and other materials-handling equipment, as well as larger and more rugged crushing and grinding equipment.

By 1920 the pattern of the modern mechanized practice in cement plants had been well established, and later improvements have taken the form of refinements in the design of the plant, the use of advanced types and larger sizes of the processing machinery, and also better utilization of all equipment. Efforts of this kind after 1920 were directed toward designs that would decrease the cost of production and improve the quality of the product.

As mechanization advanced, it was accompanied by the increased use of electrical power. Mechanical transmissions consisting of lineshafts, pulleys, and belts were displaced by individual electric motor drives, which had a profound effect on plant layout and improved flexibility of operation.

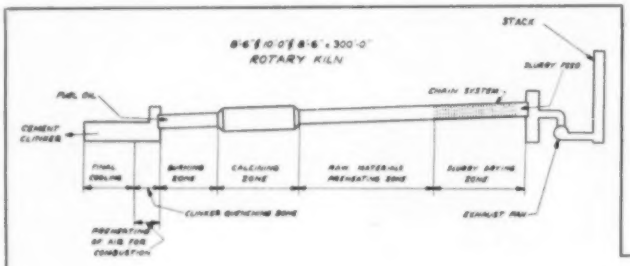
The growth of public utilities in the United States provided power networks capable of supplying, with minimum interruption, large blocks of industrial power for cement plant use, and after 1931 installations of waste-heat boilers declined. All operations in the plant proper from crushing to packing inclusive require approximately 20 to 22 kw.-hr. per bbl. From 1 to 2 kw.-hr. additional per bbl. is consumed in quarrying and loading, depending on conditions.

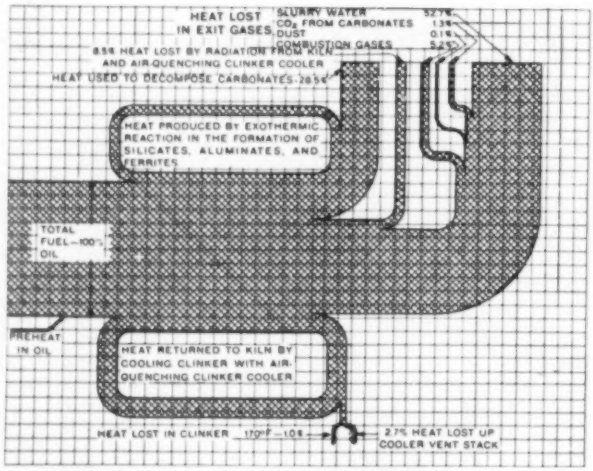
A recent publication of the American Institute for Economic Research, Great Barrington, Mass., is a booklet entitled *How to Avoid Financial Tangles*, priced at $1 per copy. Written by Kenneth C. Masteller "for the average man . . . not especially trained in law and finance," the booklet is intended to offer solutions for important financial problems confronting the individual or a business organization.

Bentonite Output, Sales Down For First Time in 11 Years

For the first time in 11 years, production of bentonite declined in 1949. According to reports of producers to the U. S. Bureau of Mines, output decreased 6 percent in tonnage and 3 percent in value as compared with 1948. Stoppage of work in the coal and steel industries was reflected in a 22 percent decrease in foundry use.

Nine states produced in 1949. Increases were reported from Arizona and Utah, and decreases from 6 states.




HEAT LOST IN EXIT GASES
SLURRY WATER 52.7%
CO_2 FROM CARBONATES 13%
DUST 0.1%
COMBUSTION GASES 5.2%
8.5% HEAT LOST BY RADIATION FROM KILN AND AIR-QUENCHING CLINKER COOLER
HEAT USED TO DECOMPOSE CARBONATES 28.5%
HEAT PRODUCED BY EXOTHERMIC REACTION IN THE FORMATION OF SILICATES, ALUMINATES, AND FERRITES
TOTAL FUEL—100% OIL
PREHEAT IN OIL
HEAT RETURNED TO KILN BY COOLING CLINKER WITH AIR-QUENCHING CLINKER COOLER
HEAT LOST IN CLINKER 170°F—10%
2.7% HEAT LOST UP COOLER VENT STACK

GRAPHIC HEAT BALANCE OF A WET PROCESS ROTARY KILN AND AIR-QUENCHING CLINKER COOLER

PRIMARY AIR TEMPERATURE	215°F
SECONDARY AIR TEMPERATURE	900°F
EXCESS AIR	10%
OIL TEMPERATURE	230°F
EXIT GAS TEMPERATURE	350°F
SLURRY TEMPERATURE	70°F
CLINKER DISCHARGE TEMPERATURE	170°F
AMBIENT AIR TEMPERATURE	70°F
CALORIFIC VALUE FUEL OIL	18,750 BTU/LB
WATER IN SLURRY	40% BY WEIGHT
HEAT BALANCE TEMPERATURE DATUM	70°F

RAW MATERIAL REQUIRED TO BURN 365 LBS. OF CLINKER (1-BARREL) 625 LBS. DRY WEIGHT CONTAINING 76%C_aCO_3.

obituaries

Services were held at Pittsburgh, Pa., on June 5 for THOMAS MACCONNELL, JR., president of the Pittsburgh Silica Sand Company, who died on June 2 in a hospital of that city at the age of 71 years. Mr. MacConnell had been president of the firm for the last 20 years.

GEORGE W. GROVE, 63, prominent mine safety engineer, who was associated with the United States Bureau of Mines for 38 years, died on June 5 at Pittsburgh, Pa. At the time of his death Mr. Grove was a senior engineer in the mine bureau's eighth region. He was a member of the National Safety Council, the Mining Inspectors Institute of America, and related organizations.

BRIANT S. YOUNG, retired American Portland Cement Company executive, died on May 31 in Los Angeles, Calif. He was 78 years of age.

LOUIS F. HART, 58, who had been general manager of the Wabash Sand & Gravel Company and secretary-treasurer of the Terre Haute Co-operative Company, as well as a member of the firm of the Terre Haute Concrete Supply Company, died at Terre Haute, Ind., on May 25.

THOMAS J. CURTIN, retired lime manufacturer, died in Cheshire, Mass., at the age of 82. Originally engaged in the manufacture of cement, Mr. Curtin, with his brother, C. J. Curtin, bought the Farnams Lime Company in 1904. He was manager of that company and in direct charge of operations until 1929, when the business was sold to the United States Gypsum Company. He remained as plant manager until his retirement in 1935.

ROBERT F. MCCONOCHIE, 75, president of the Rock Island Sand and Gravel Company, Rock Island, Ill., died on May 25 at his home in that city. He had been president of the sand-and-gravel firm for the last two years, having previously been vice-president and a director.

GORDON H. TARBELL, 67, a retired vice-president of the National Gypsum Company, died on May 16 after a heart attack on his farm in Rushford, N. Y. He had retired from business life in 1948.

Mr. Tarbell was graduated from the School of Engineering at the University of Michigan. After his graduation, he worked several years for the U. S. Gypsum Company at Oakfield, N. Y., and joined the National Gypsum Company in 1928. For many years he was vice-president in charge of production.

ROBERT R. HAYS SR., retired sand and gravel plant operator of Wynne, Ark., died recently in his home after an illness of two years. Mr. Hays founded the Hays Gravel Company and managed the business until a year ago. He was 77 years of age.

JOHN ALBERT CREASOR, 57, a construction engineer with the Canada Cement Company, Ltd., in Montreal, died on May 23. He was a graduate in engineering from McGill University.

WILLIAM H. GABELER, manager of the phosphate rock division of the Davison Chemical Corporation, died at Bartow, Fla., on April 29 after a heart attack. He had helped develop a number of chemical operations, including production of a silica gel catalyst for the synthetic rubber program during World War II. He was 58 years of age.

DOUGLAS E. WOLFE, 59, assistant to the general manager of the Trinity Portland Cement Company, died on April 25 at his home in Dallas, Tex., after an extended illness. He had been associated with the cement firm for more than 30 years.

ANDREW G. LOOMIS, retired secretary-treasurer of the Consolidated Quarries Corporation of Decatur, Ga., died on April 7 at an Atlanta hospital after an illness of a month.

CLAUDE K. SEIPEL, 56, a salesman for many years for the National Portland Cement Company of New York, died on May 1 at a hospital in New Rochelle, N. Y.

EARL P. HAUBERT, SR., former controller and purchasing agent for the Lawrence Portland Cement Company of New York, died on May 15 after a brief illness at the age of 63 years. He had been associated with Lawrence Portland Cement for the last 14 years.

BEN E. MEGUSCHAR, 55, northern sales manager of the International Minerals and Chemical Corporation, died on April 8 at a hospital in Evanston, Ill. He was 55 years of age.

Year's Explosives Research Reported by Mines Bureau

Development of a safety code for the use of liquid-oxygen explosives, based on exhaustive laboratory tests, was one of the many research projects successfully completed last year by U. S. Bureau of Mines scientists studying explosives, explosions, and flames, according to an annual report of research and technologic work in this field released by the U. S. Department of the Interior.

Other achievements during the year included making chemical and physical tests of permissible explosives. The report is divided into seven sections: explosives research, chemical and physical tests of explosives, flame and combustion research, flammability of gases and vapors, experimental coal mine and dust explosions, work for other agencies, and demonstrations of mine fires and explosions.

The Bureau research included the safety and performance characteristics of liquid-oxygen explosives (used extensively for open-pit blasting in this country), the preparation of explosives of fixed particle size and shape, and the stability of the plane detonation wave.

The research on flame and combustion was continued on a broad scale. Among fields in which studies of this nature find practical application are gas turbines, jet-propelled aircraft, high explosives, industrial furnaces, and gas burners.

A free copy of *Report of Research and Technologic Work on Explosives, Explosions, and Flames, Fiscal Year 1949*, by Bernard Lewis, may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

Kaolin or China Clay in 1949 Declines from 1948 Total

Domestic output of kaolin or china clay declined in 1949 to 1,418,316 tons —10 percent below the 1948 record of 1,568,848 tons, according to reports of producers to the U. S. Bureau of Mines.

Mine shipments were reported in 10 states, but most of the tonnage came from Georgia and South Carolina. Georgia contributed 71 percent of the total; South Carolina ranked second with 19 percent; Pennsylvania, third; and the remainder came from Alabama, California, Florida, Illinois, North Carolina, Utah, and Virginia.

Three Men Fatally Injured In Premature Quarry Blast

Three men were killed at the Auglaize Stone Company, Defiance, O., and one was injured in a dynamite explosion at the quarry on May 29. Those fatally injured were Lloyd Garrison, 35, Findlay, O., a representative of the Atlas Powder Company; Roy Yenser, 59; and his brother, Charles Yenser, 49. The brothers were employees of the stone company.

It was reported that the blast occurred while four tons of dynamite was being placed in holes.

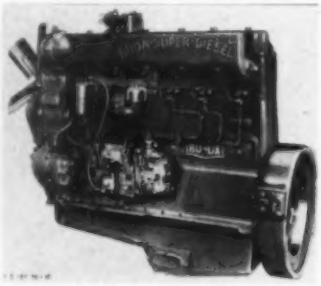
new machinery and supplies

Pit and Quarry

● Heavy-Duty Truck Diesels

The Buda Company, Harvey, Ill., has announced the development of three new "161 Series" heavy-duty diesel truck engines—models 6 DAS-844 supercharged, 280-hp. diesel; 6DA-844, 215-hp. diesel; and 6 DA-779, 185-hp. diesel. All are six-cylinder models with practically the same mounting dimensions and are built on the same 161 Series production line. Displacement is 844 and 779 cu. in., respectively.

These DA engines have a new special mono-lobe "Dyna-Swirl" combustion

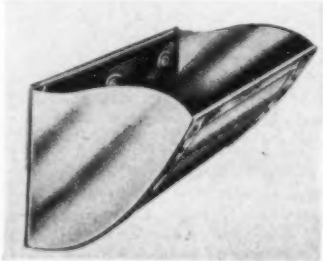


chamber which enables them to develop increased horsepower. The Buda controlled-turbulence low-pressure combustion system reportedly insures thorough utilization of the fuel. Crankshafts are completely counter-balanced, and engines are provided with torsional vibration dampeners to insure smoother engine operation. A large number of the engine parts such as intake manifolds, compressor brackets, oil cooler housing, gear housing and covers, etc., are made of aluminum to reduce the total weight of the engine.

● Elevator Buckets

The manufacture of the "Hi-Cap" line of high speed elevator buckets has been announced by the Fort Worth Steel & Machinery Co. of Fort Worth, Tex. These new buckets have been designed for versatility and durability. They are suitable for handling any powdered or granular free flowing material which is not excessively abrasive, and reportedly perform with equal efficiency at either high, medium, or low speeds. They are said to be suitable for either replacement purposes or new installations in chain or belt elevators.

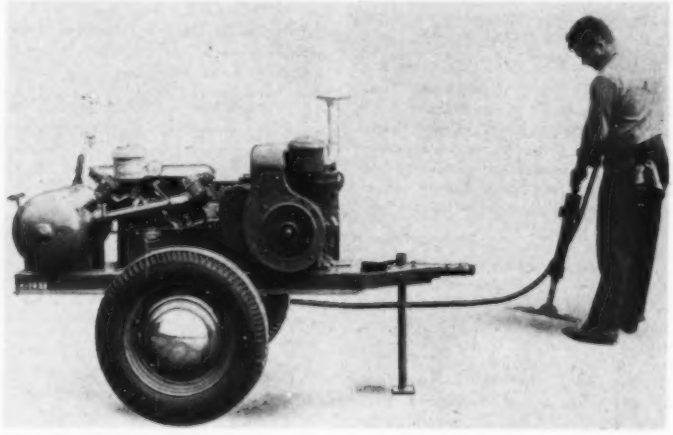
Hi-Cap elevator buckets are made from heavy gauge cold-rolled steel. The ends of the buckets are formed so as to support the body of the bucket. Ends and body are spot welded.



● Portable Air Compressors

Two new Blue Brute portable air compressors have been introduced by the Worthington Pump and Machinery Corp., according to an announcement by the Holyoke Works, where the machine is being manufactured. Hand truck and trailer models are featured. These two-stage air-cooled compressors with 30-cu. ft. capacity at 100 lbs. pressure have a maximum operating pressure of 159 lbs.

Although basically engineered for low cost and small capacity, they contain the same mechanical features as larger Worthington portables. Powered by a hand-cranked, air-cooled gasoline engine, they have a patented feather valve, suction valve unloading, and a general design readily accessible for easy maintenance. They are equipped with air maze oil bath cleaners and standard A.S.M.E. air receivers. A protective all-steel canopy is also available. Worthington Pump and Machinery Corp., Harrison, N. J.



● New Gearmotor Line

Foote Bros. Gear and Machine Corporation of Chicago and The Louis Allis Company of Milwaukee have announced a joint program for the manufacture and sale of a complete line of gearmotors. The new Foote Bros.-Louis Allis Gearmotor makes use of hard helical gears and other moving parts which have been processed and heat-treated under new improved methods of manufacturing control, said to have produced a high standard of performance with regard to load carrying capacity, wear life, quietness of operation and compactness of design.

The new gearmotor, manufactured in 17 sizes, provides single, double and triple reduction units having output speeds from 780 r.p.m. down to 7.5 r.p.m. Integral horsepower ratings from 1 through 75 are available for practically any in-

B.F.Goodrich

Why you get more recappable tires when you use B. F. Goodrich

IN TOUGH, off-the-road operations like that shown above, mileage doesn't mean much in measuring tire service. Instead, the yardstick is number of hours a tire works and whether or not worn treads can be recapped, or if sharp, jagged rocks cause serious tread cuts.

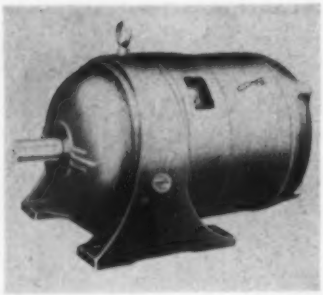
Reports from B. F. Goodrich users indicate top performance of BFG tires as compared with other brands. For example, one operator reported over 4,500 service hours from B. F. Goodrich *Universals* vs. only 1,600 hours from another make in identical service.

B. F. Goodrich tires stand out in service for many reasons. Tread rubber is specially compounded to resist cutting. More tires can be recapped because they have double bruise protection in the B. F. Goodrich *double nylon shock shield* . . . layers of nylon cord built in between the tread and the body plies.

Only BFG gives you the added protection of the nylon shock shield; the added savings of (1) longer tire life (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires. But nylon shock shield costs no extra — you pay no premium!

Another "special" is the new ALL-NYLON tire for tough construction projects, quarry work, strip mining, etc. In all tests, not a single BFG All-Nylon tire blew out, not one flex break occurred!

There's a specially designed off-the-road type B. F. Goodrich tire for every need. See your dealer or write, wire or phone — *The B.F.Goodrich Company, Akron, Ohio.*



dustrial application. A wide selection of motor enclosures is offered, including the conventional open drip-proof, splash-proof, totally enclosed and explosion-proof construction. A.-c. and d.-c. motors of all types, as well as motors having special electrical characteristics, are available to meet unusual installation and application requirements.

● Truck Engine

Two major improvements designed to increase power plant life and afford greater serviceability have been incorporated in Federal Motor Truck Company's Series 60 engine, the company has announced. To lengthen exhaust valve life, rotators have been added to the engine. Rotators turn the valves slowly during operation, insuring more even seating and cooler running. New interchangeable precision copper-lead alloy bearings with an electrically-coated inside of lead and tin have replaced the bronze-backed cadmium-nickel bearings.

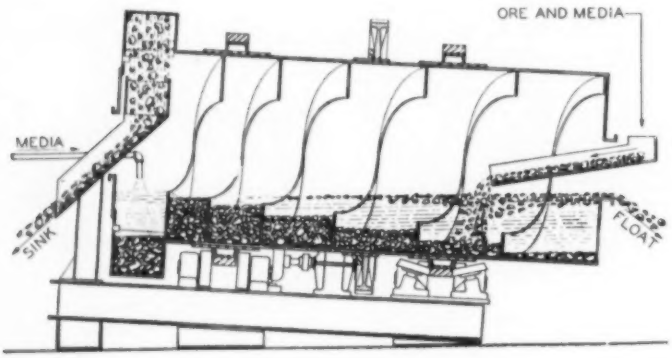
Design of the bearings is such that the complete assembly can be removed without disturbing the crankshaft. The connecting rod bearings have also been changed from cadmium-nickel to the new copper-lead type. Federal Motor Truck Co., Detroit 9, Mich.

● Heavy-Media Separator

A new device has entered the heavy-media ore beneficiation field—the Hardinge heavy-media separator, made by Hardinge Co. Inc., York, Pa.

The Hardinge separator is a slowly-revolving, inclined, cylindrical drum with spiral flights attached to the inner surface. The material to be separated, accompanied by heavy media, is fed in at the lower end. As the drum rotates, the "sink" is carried by the spiral flights to the high end. The "float" overflows a circular weir at the lower end.

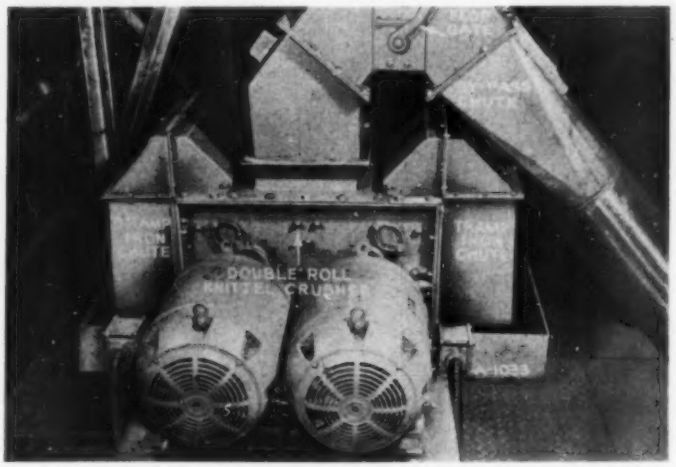
This simple but effective device has no internal moving parts to grind against each other; thus, maintenance is extremely low. The quantity of media to fill this circuit is considerably less than with a cone of equal capacity. The separator will handle large pieces of ore—up to 4 in. in size. It can act as a medium reservoir and will start up easily after being shut-down for several hours.

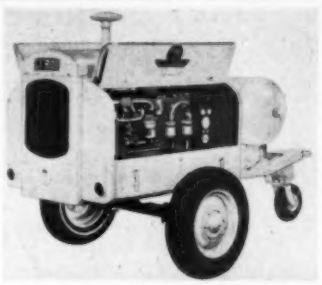


● Non-Clogging Crusher

Retaining all of the advantages of the standard Knittel unit, the S-A "Double Rotor Knittel Crusher" has expanded the application of this type of crusher to include many materials which tend to clog and reduce crusher capacity. The manufacturers state that power plant installations show that this new unit gives the same horsepower per ton ratio with wet coal that has been achieved on dry coal by the standard Knittel crusher.

The S-A Double Rotor Knittel Crusher is equipped with two rotors driven by separate, direct-coupled motors. Synchronization is said to be unnecessary, as the crushing sectors on the rotors operate independently, first splitting the coal on initial impact and then crushing it on the breaker plates. Sized slots in the crusher grate bars determine maximum size of material. Since the triangular sectors are held in position only by centrifugal force, they are free to adjust position on impact with tramp iron, or other foreign material. Hinged fingers on each side of the crusher allow the sectors to bat tramp iron out without damage to the crusher. Stephens-Adamson Mfg. Co., Aurora, Ill.





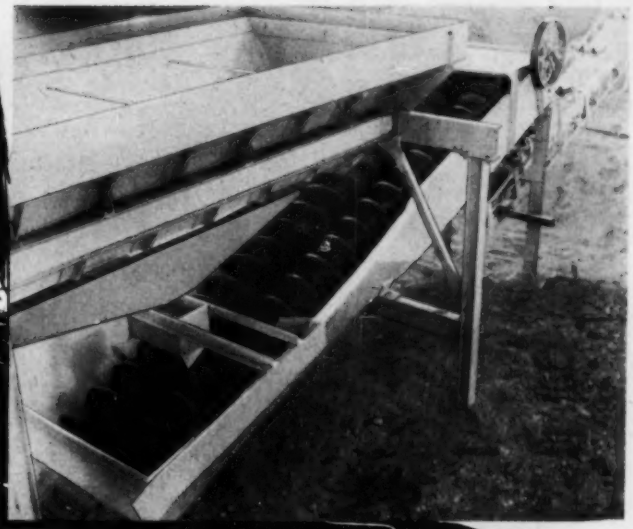
The liquid-cooled "105 Airmaster" is a lightweight unit designed for frequent moves and transporting over rough ground with the minimum number of men. The compressor develops its 105 c.f.m. at a speed of 1100 r.p.m., which involves a low piston speed consistent with minimum wear of the unit. Le Roi Company, 1700 South 68th Street, Milwaukee 14, Wis.

● Hyraulic Loader

The Skyline "90" series front-end hydraulic loader features a third ram, a two-way actuating ram giving positive control of all attachments in all positions. It is said to speed up clean and accurate dumping and return of buckets or forks.

This two-way ram develops over 8,000 lbs. of pressure on the down stroke and 6,500 lbs. on the up stroke, permitting actual digging and breaking loose of

QUIT WASHING SAND DOWN THE DRAIN!



IT'S SIMPLE AS A B C

With the profitable combination shown above you can recover valuable, saleable sand that may now be going "down the drain." Dakota Sand & Gravel Co., Bismarck, N. D., uses an Eagle Water Scalping Tank to concentrate water borne sand and an Eagle Double Screw Long Weir Washer-Classifier-Dehydrator to wash, classify and dewater sand.

At Dakota, gravel is conveyed to an elevated wet screen. Material passing the bottom deck of the screen flows into an Eagle Water Scalping Tank. Solids quickly precipitate and flow to the Eagle Screw Washer below, through adjustable gates on the bottom of the tank. The dirty water flows over a weir to waste. Design of the scalping tank is based upon long experience and experimentation — one of those "things that couldn't be done." The water heavily charged with sand which is deposited in the screw unit, is quickly processed — the wash water flowing over the adjustable long weir at the lower end of the tub and the sand carried to the discharge at upper end of tub. The sand comes out clean and dewatered, and fed to conveyor belt stockpiler. Fines can be retained by raising weir on tub to increase head and reduce velocity — adjustable weir length flows off more or less fines. Many sand and gravel producers are now profiting from this combination.

Send for literature — Washer Cat. 47, Scalping Tank Bulletin 150.

SINCE 1872 Progress...Service

EAGLE IRON WORKS

133 Holcomb Ave. • Des Moines, Iowa

Investigate the Eagle "Swintek" Dredging Ladder — agitates bonded material, screens nozzle against boulders, carries oversize out of pumping zone. Catalog 745.

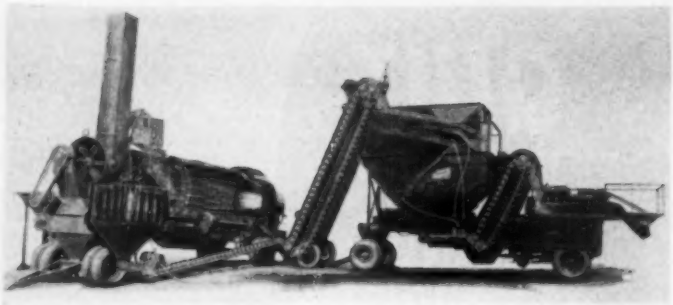
heavily imbedded objects. The "90" has its own complete hydraulic system, including "Pesco" pump. The entire loader can be removed as a unit without breaking any of the hydraulic lines.

Some of the other outstanding features of the "90" are low clearance, with no superstructure, facilitating transportation; clear visibility for the operator; rugged,

reinforced basic back, to which all attachments are fitted; and flexibility without sacrifice of strength or ruggedness.

The "90" is at present available for 23 models of tractors including Ford, Ferguson, Farmall M, Farmall H, John Deere A, John Deere B, Allis-Chalmers WC, Oliver Row Crop 70, and Massey Harris Senior 101-44 and Junior 102.

This Skyline unit reportedly can lift 1,000 lbs. quickly to the maximum lift height of 10 ft. with bucket or fork, or 14 ft. 4 in. with combination sweep-rake stacker. The Skyline Corporation, Inc., 1521 McLean Blvd., Wichita 12, Kan.



● Portable Asphalt Plant

The "Model 51 Continuflo" central-mix asphalt plant, a product of the Pioneer Engineering Works, Minneapolis, Minn., has a rated capacity of 50 to 70 t.p.h. and operates on the continuous-process principle. The plant is highly portable, consisting only of two main units. On one unit are the burner, combustion chamber, drier, dust collector and fan, all on a single pneumatic-tired chassis. On the other unit are the gradation screen, three-compartment aggregate bin, mixer elevator, pug-mill and truck loading hopper, also on a single pneumatic-tired chassis.

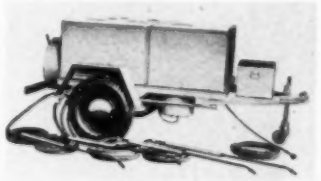
Feeder, cold and hot elevators can be moved on their own wheels or readily moved on a truck for quick transporting. No erection work is involved in setting up the plant. Either a steam atomizing or an air atomizing burner are available. With the latter, no steam is required at the drier. It is not necessary to shut down the mixer to allow the empty trucks to pull in for loading. The entire plant is electric motor driven, with individual motors for each functioning unit. All motors are controlled from two push-button stations, one at the mixer platform, the other at the base of the drier.

● Steam Cleaner

"The Super-Duty Hypressure Jenny Steam Cleaner," designed and built to do the biggest cleaning jobs, and also for heat-transfer uses, has been announced by the Hypressure Jenny Division, Homestead Valve Manufacturing Co., Coraopolis, Pa.

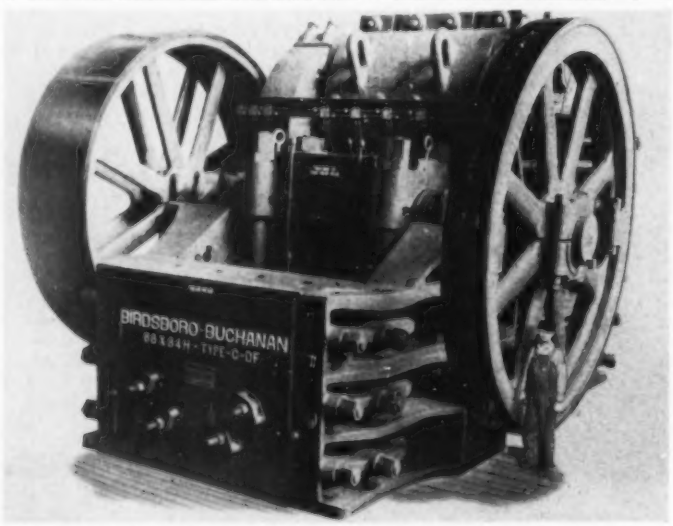
As a steam cleaner, the Super-Duty Hypressure Jenny is said to clean grease, grime, and dirt from machinery and equipment 48 to 60 times faster than by hand methods and six times faster than other mechanical steam cleaners. With a capacity of 300 gallons per hour, it will operate from one to four cleaning guns. Full operating pressure is reached within two minutes from a cold start.

In less than two minutes, it can be changed over for use as a heat generator, with heat output equivalent to a 25 hp. boiler. Change is completed by simply loosening two bolts and revers-

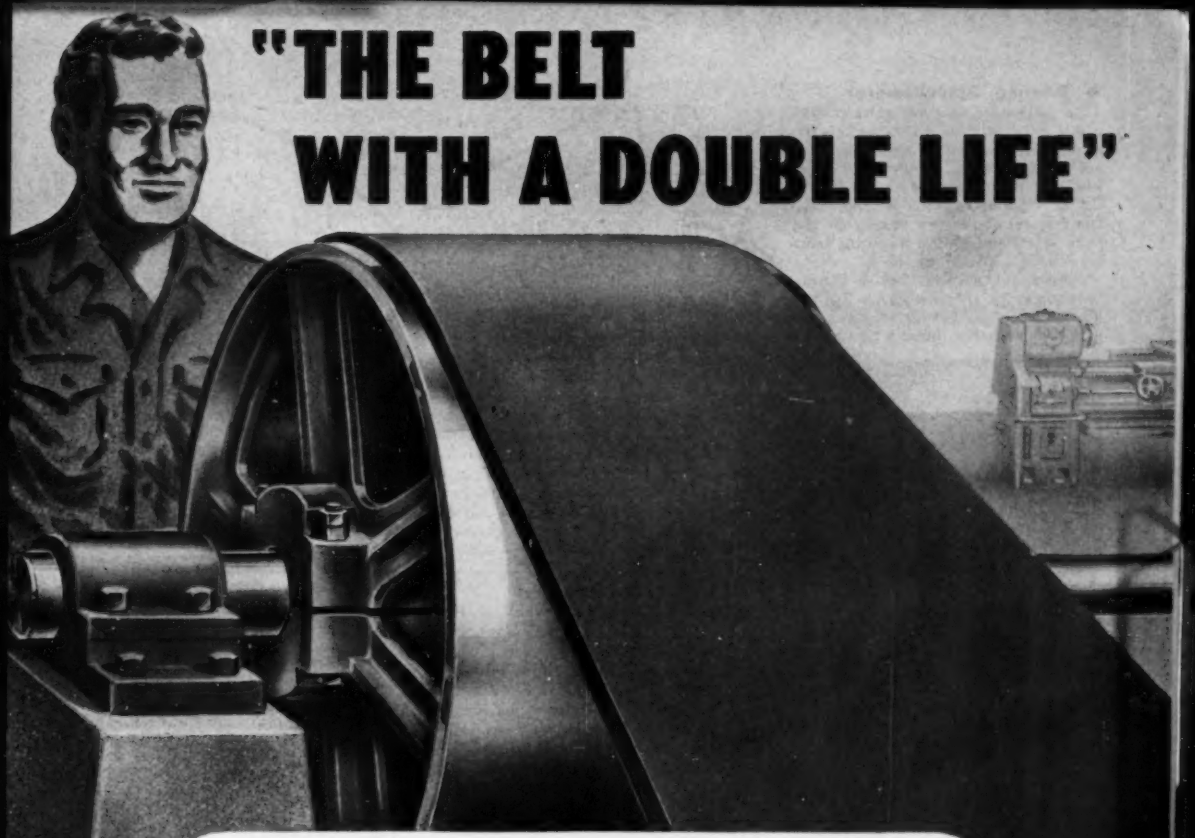


ing the crank arm. The unit is then ready for such jobs as heating tanks of viscous fluids, e. g., tar or molasses, thawing frozen cars and culverts, pasteurizing, sterilizing soil, etc.

This cleaner is made in trailer-mounted, portable, and stationary models. Standard equipment on all models includes one ½-in. Hypower cleaning gun, one 25-ft. length each of ½-in. and ¾-in. vapor hose, and a choice of a gasoline engine or a 1-hp. electric motor. Weighing approximately 1600 lbs., the unit measures 48 in. in width by 44 in. in height, and varies in length from 78 to 132 in., depending upon the model chosen.



Said to be the largest deep-frame jaw crusher ever built, the giant crusher designed and built by the C. G. Buchanan Crushing Machinery Division of Birdsboro Steel Foundry and Machine Co., Birdsboro, Pa., takes up 4 to 5 cu. yds. of stone at a swallow, to keep pace with modern power shovels. The crusher is a deep frame type, with sectionalized side frames and a 66- by 84-in. receiving opening. It weighs 275 tons and has a maximum capacity of 900 to 1000 t.p.h., if feeding is continuous. It is claimed that operating and maintenance costs are reduced by specially designed built-in features. Note the dwarfed appearance of the man standing beside the crusher.



"THE BELT WITH A DOUBLE LIFE"

QUAKER TRANSMISSION BELTING

LASTS 10 YEARS . . . CUTS COSTS IN HALF!

Day and night for six years . . . regular running for more than four years. That's the service record of an eighteen inch, six ply Quaker Ironsides Endless Belt on a forty foot drive powered by a 150 horsepower steam engine. Twice the length of service of any other belting . . . a saving of more than $400.00.

More proof of why more plants are specifying Quaker for quality. Each and every Quaker Belt is designed for a particular job . . . pre-tested and performance proved for maximum service and lower operating costs.

That's why you'll find so many drives equipped with Quaker Belts throughout the Rock Products Industry.

For less wear, stretch and slippage . . . for positive power transmission Quakerize your drives. There's a Quaker flat belt or V-Belt for every industrial need. Write for complete catalog.

PACKINGS THAT PRESERVE POWER

Quaker packings are pre-tested for size, shape and quality to assure perfect fit, long service, maximum power.

HOSE FOR RUGGED WEAR

Pre-tested and performance proved for flexing and strength, there is a Quaker Hose for air, steam, liquids.

QUAKER RUBBER CORPORATION • PHILADELPHIA 24, PA.

Division of H. K. Porter Company, Inc.

Pittsburgh • New York • Cleveland • Chicago • Houston • Atlanta

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QUAKER RUBBER PRODUCTS *custom made for every industrial use*

QUAKER RUBBER CORPORATION · PHILADELPHIA, PA. · QUALITY SINCE 1918

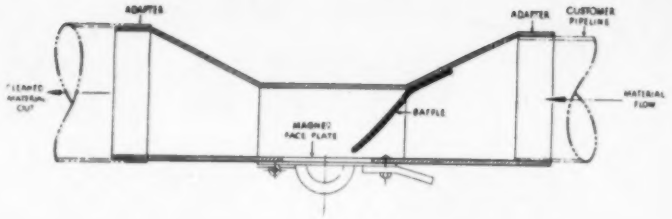
● Blasting Galvanometer

An adjustable blasting galvanometer, which gives accurate resistance readings in ohms even when its activating cell is not at full strength, is now being made available to blasters by Atlas Powder Co. of Wilmington, Del. Several exclusive features of the new instrument give extra safety and control in testing blasting circuits before firing.

Known as the Atlas No. 4 Blasting Galvanometer, the instrument is calibrated to an accuracy of less than one-half ohm resistance, making possible the

checking of small resistances such as a single blasting cap. In addition, the new galvanometer may be used as an ammeter in the detection of stray currents, a function especially useful in underground blasting work, affording an extra measure of protection before hooking up the circuit.

The instrument is easy to use, having three terminal posts marked for connections in making three types of readings.



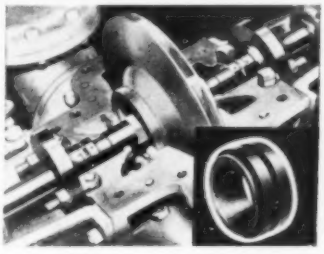
● Magnetic Separator

The new permanent magnetic separator for the removal of tramp iron from material flowing in round gravity flow pipes is announced by Eriez Mfg. Co., Erie, Pa. The unit features an adaptor which makes installation easy, adds to separation efficiency, and provides cost economy. This separator is a complete package of magnet and adaptor. To install the magnet in the pipe line, the customer needs only to cut out a small section of the pipe where the magnetic protection is desired. At the inlet side the adaptor fits over the outside diameter of the pipe. At the outlet side it fits inside the pipe. Once installed the unit offers maximum magnetic protection because the material being cleaned passes directly over the base plate of the magnet. It is suitable for use in the purging of tramp iron from all free-flowing materials conveyed in round gravity flow chutes.

● Self-Lubricating Seal

Morganite Inc., 3302 48th Avenue, Long Island City, N. Y., announces a new self-lubricating mechanical seal claimed to be capable of withstanding corrosive chemicals, offering a perfect seal for highly volatile fluids under high pressures. These seals perform satisfactorily in continuous service at high shaft speeds.

Morganite carbon seals are also said to be mechanically strong, immune to most chemical attack, and free from warping and gumming tendencies. Entirely self lubricating, they require no attention for lubrication during the life of the seal. This feature makes Morganite particularly adaptable for installation in inaccessible locations where maintenance and servicing would be difficult and, in many cases, would require costly down-time of equipment. The seals are particularly recommended for use in pumps, agitators, mixers and similar installations handling corrosive,



volatile or otherwise difficult-to-handle liquids.

In addition to seal applications of high efficiency, Morganite carbon specialties provide trouble-free bearings, rings, valves and slides, all of which feature self-lubricating and non-gumming and non-sticking properties.

● Heated Rear-Dump Body

Euclid Road Machinery Co. is now furnishing units with heated rear-dump bodies in which hot exhaust from the engine manifold is transferred through a flexible metal tube to the inlet in the bottom of the body. The double-wall construction of the bottom, front, and the lower portion of the sides allows the gas to circulate freely and be exhausted through a vent in the side.

In localities that necessitate hauling during rainy seasons or jobs that require hauling of wet, sticky loads, the heat will dry the material in contact with bottom and sides sufficiently so that it readily sheds from the body when dumping. Heated bodies are now optional equipment and are available on all Euclid rear-dump models, ranging from 10 to 34-ton capacities.

● Washing Screen

Thorough washing and breaking up of the mass before separation is accomplished in Reliance Washing Screens through the use of a slush pan and a special type of scrubbing section.

The slush pan is a receiving hopper placed at the head of the screen into which the material is discharged from the elevator or conveyor. This pan is fitted with spray nozzles which completely saturate the material before it enters the scrubber.

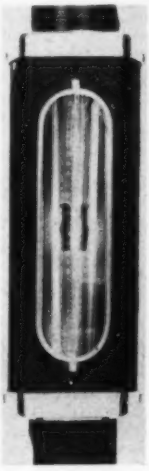
The scrubbing section is of special design, varying in length and size to meet different conditions. It is furnished with patented spray nozzles which penetrate and thoroughly break up the mass of material, separating the clay, loam, and sand from the gravel before passing

to the sizing section of the screen.

These spray nozzles extend into the screen proper, with an auxiliary set outside the sand jacket, keeping the screen clean as well as washing the sand and gravel.

A sand jacket, usually of galvanized woven wire, surrounds the first sizing section of the screen, the sand and water passing through this jacket to a special drip pan which carries them to the wash box. This drip pan is of welded steel construction, preventing leakage into the bin. Manufactured by the Universal Road Machinery Co., Kingston, N.Y.

● Flow Rate Meter



The "Flowrator," a device developed by the Fischer & Porter Company, Hatboro, Pa., is a variable-area type flow rate meter, the performance of which follows the general flow equation: $Q = CA \times V 2gh$. It has been successfully utilized in the feldspar and phosphate industries, and consideration is being given to similar instrumentation by copper, lead, and zinc refiners.

The instrument is a vertically tapered tube with the smallest diameter at the bottom. In this tapered tube a weighted metering element (float) of fixed diameter is free to move upward or downward. Since it is of fixed weight, the float establishes pressure differential "h" as a constant, thus establishing linear relationship between float movement and the rate of flow.

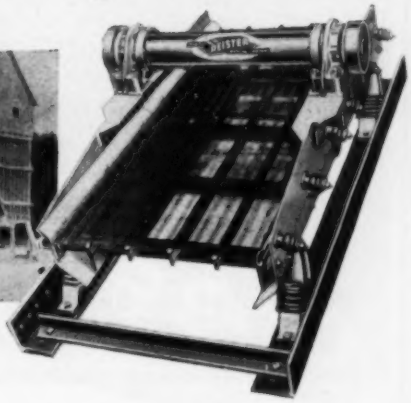
Flowrators are available in simple, low-cost indicating form and also with remote or close-coupled recording-controlling systems. The recorders are equipped with unique frictionless, packless transmission systems. According to the manufacturer, the Flowrator provides positive, fine, and quickly made adjustments to the reagent feed.

● Elevator Backstop

A simplified backstop which automatically prevents the "backing up" or "running away" of inclined conveyors, bucket elevators and similar equipment has been produced by The American Pulley

1st Production report on New Deister Ag-Lime Screen

SIDWELL BROTHERS PLANT



One year ago, we released one of our new Ag-Lime Screens for production tests to Sidwell Brothers, Deavertown, Ohio. It performed so well that a second screen was added later.

Carl Sidwell sums up the exceptional all-round performance of the Ag-Lime Screen this way:

"As you know this is a very hard stone to screen. You really helped to solve our problem when you came out with this lightweight, steep-incline and high-speed screen. They are doing a very good job."

Both of the revolutionary Ag-Lime Screens at Sidwell are equipped with ¼" square opening cloth and .041" diameter wire. Screen Number One is fed 30 tons an hour, with 10 tons going through. Moisture content is 1½ to 4%. Largest particle in feed is 1 inch.

Ag-Lime Screen Number Two receives 35 tons an hour, with 15 tons going through. Moisture content is ½ to 1½%. Screen cloths last an average of five months.

This is high-capacity handling and accurate sizing of damp sticky materials without blinding. The new Deister Ag-Lime is revolutionary: lighter in weight, operates on a faster stroke cycle — especially designed to handle aglime and other damp fines. The experience of Sidwell Brothers is proof enough that for economical screening of agricultural limestone, you can't beat the new Deister Ag-Lime Screen. For particulars, write for Bulletin No. 51 today.

DEISTER SCREENS

DEISTER MACHINE COMPANY

FORT WAYNE 4, INDIANA

DREDGES 150 MILLION CU. YDS. —STILL DIGGING

YCGF No. 14 is one of a fleet of 18 cu. ft. YUBA bucket ladder dredges with digging depths ranging from 80' to 124' below water level. They range in age from 11 to 38 years.

YCGF No. 14 has averaged over 21½ hours operating time daily, digging and treating alluvial gravel

Dredge YCGF No. 14 was built by YUBA in 1912 for Yuba Consolidated Gold Fields. It has 18 cu. ft. buckets (originally 15 cu. ft.) and was designed to dig 62' below water level. To reach deeper gravels near Hammonton, California, Yuba later rebuilt the dredge to dig 80' below water. Except for the war years, No. 14 has operated continuously.

BRING YOUR DREDGE PROBLEMS TO YUBA

The story of No. 14 is typical. Many YUBA dredges are operating efficiently after 25 years or more service. Often these dredges have been moved and redesigned to meet new operating conditions; thus, capital investment is spread over many years and great yardage.

No matter what your problem—deep ground, hard bedrock, boulders, levee or stream control—YUBA can help you. We will build a new dredge for you, help you obtain a good used dredge, or move, redesign and rebuild an old one. Write or wire us TODAY. No obligation.

YUBA MANUFACTURING CO.

Room 718, 351 California St., San Francisco 4, California, U. S. A.

AGENTS { SIME, DARBY & CO., LTD. · SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON

YUBA DREDGES

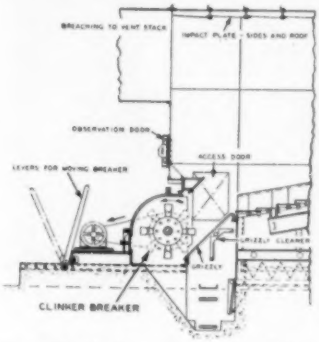
Company, Philadelphia, Pa., as a ready-made device for immediate installation. The backstop is a ratchet-type device which automatically operates when power interruption, overload cutout, or failure of the prime mover occurs. It can be mounted in any position on the head shafts of conveyors or elevators.

As long as the shaft is turning in the proper direction, the pawl is entirely disengaged from the ratchet, so that there is no drag, no vibration and no noise. Immediately upon reversal, the pawl automatically engages the ratchet, locks the shaft in place and holds it in position until forward power is again applied, at which time the pawl pulls out of the ratchet teeth.

● Clinker Breaker

Designed as an adjunct to the Fuller inclined grate cooler, to break up larger or oversize pieces of clinker, coating, or ring material before discharging them from the cooler, the Fuller clinker breaker is offered by the Fuller Company, Catasauqua, Pa.

Clinker too large to drop through the grizzly slides down the bars into the path of a set of constantly whirling swing hammers, the impact of which shatters the oversize pieces and projects



most of the fragments backward into the interior of the cooler, where further cooling can take place. Speed of rotation permits the oversize pieces to fall into the path of the hammers. Hammer wear is said to be kept at the minimum because the breaking is accomplished by impact and not by attrition.

Having passed through the breaker, all the clinker discharged from the cooler is in sizes smaller than that of the grizzly openings, so that it is not necessary to remove oversize pieces by hand in order to "unchoke" the discharge grates. Cleaning fingers, operating in the slots between the bars, are actuated by a crank arm outside the cooler and may be used at intervals to free pieces tending to become wedged in the bars.

The breaker, with driving motor and a partial casing, is mounted on a sliding base. The entire assembly can be moved away from the end of the cooler on slide rails (furnished) when repairs are necessary.

The Fuller clinker breaker is driven at 345 r.p.m. through a multiple V-belt drive and operates continuously.

● Particle Size Analyzer

A new instrument, the Sharples "Micromerograph," for measuring the particle size distribution of a powdered material in the subsieve range, is offered for sale by The Sharples Corporation, 23rd and Westmoreland Streets, Philadelphia 40, Pa.

The Micromerograph utilizes a technique in which a powder is dispersed in air and is allowed to settle under the action of gravity through an enclosed tube onto a balance pan. The balance is a fast response continuously recording servoelectric type which yields automatically a continuous record of the weight of powder settled plotted against time. This weight-time chart is easily converted to a weight distribution curve by the application of Stokes' law.

Deagglomeration of the sample at the top of the column is achieved by firing it at high velocity through an adjustable aperture. The aperture is formed by mating frustro-conical surfaces, the inner of which may be moved axially by means of a calibrated micrometer screw. The viscous shearing forces of the gas flow in the aperture produces extremely effective dispersion of the powder sample.

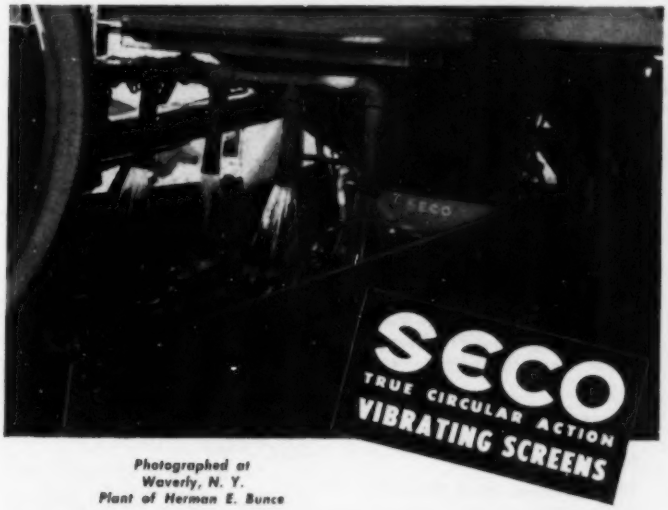
The time required for an analysis by the Micromerograph varies from a few seconds to several hours, depending on the material. The instrument is recommended for materials having particles in the range of 2 to 150 microns. The exact operating limits depend on the density of the material, the allowable time of analysis, and the precision required.

Micromerograph determinations are said to be accurate and highly reproducible. The gaseous sedimentation principle and the efficient deagglomerator device reportedly have overcome the difficulties associated with the conventional liquid sedimentation analysis methods. With automatic operation and recording, labor is required only to start an analysis and to plot the distribution curve from the recorder chart at its completion.

The instrument is supplied complete with feed system, settling column, balance, electronic servomechanism, and recorder. The instrument requires a wall or rigid column about 10 ft. in height for mounting and a total floor space of about 1½ by 3 ft.

Standard Steel Corporation of Los Angeles, one of the largest fabricators of heavy steel plate in the West, announced the outright purchase of the Drying Machinery Division of Hersey Manufacturing Company of Boston, Mass. Standard Steel has for many years manufactured drying and dehydration equipment for chemicals, fertilizers and by-products.

PASSING EVERY SCREEN TEST...



Photographed at Waverly, N. Y. Plant of Herman E. Bunce

1 ACCURATE SIZING

The sharp action of a Seco forces the load through the meshes and the natural conveying action quickly carries the oversize into the discharge chute.

2 LARGE TONNAGES

The controlled true circular motion of a Seco vibrating screen makes every inch of screening surface equally effective — thus maintaining capacities.

3 SMOOTH OPERATION

Seco's exclusive patented construction controls the true circular action of the screen in operation. Result: *no vibration* is transmitted to the supporting framework.

4 LONG LIFE

Many Seco screens are in their eleventh, twelfth and thirteenth years of efficient service. Seco controlled true circular action means less stress on shaft and moving parts.

5 TROUBLE-FREE PERFORMANCE

Seco advanced engineering *plus* Seco high standards of quality in materials and workmanship pay off in greatly reduced maintenance on the job. . .

There's a right Seco for any screening job from ag-lime to rip-rap. Send for Catalog No. 203, Dept. L.

SECO VIBRATING EQUIPMENT

SCREEN EQUIPMENT CO., INC.

1752 WALDEN AVE. BUFFALO 21, NEW YORK

In Canada, United Steel Corp., Ltd., Toronto, Ontario

trade notes

Dozier-Graham-Eastman, Los Angeles, Calif., one of the larger industrial advertising agencies west of Chicago, celebrated its 25th anniversary in May.

During its 25 years of constant growth, Dozier-Graham-Eastman has steadily progressed from a small, one-man operation to a completely integrated organization of national prominence, specializing particularly in the industrial field.

As of June 1, 1950, Jack D. Grace will be in charge of advertising and publicity activities at the Nordberg Manufacturing Company under the direction of Carl O. Friend, sales research manager.

Delbert Kay, who has handled advertising at Nordberg for many years, plans to retire. Until his retirement Mr. Kay will be engaged in field work.

James A. Friend

James A. Friend has been appointed senior vice-president of the Nordberg Manufacturing Company, Milwaukee, Wis., according to a recent announcement. Mr. Friend, former vice-president and general purchasing agent, will take over the duties of F. Howard Kilberry, who resigned to become a management consultant in charge of the Superior Engine Division of the National Supply Company at Springfield, Ohio.

Mr. Floyd T. Finley has been appointed general purchasing agent of the Milwaukee Division of Nordberg to succeed Mr. Friend.

It is also announced that D. A. Cheyette, vice-president of the Crusher Division, has been elected to Nordberg's Board of Directors. Another appointment was that of Arthur W. Mueller, who was named assistant controller of the company.

Smith Engineering Works, Milwaukee, Wis., announces the following new agent appointments:

Hawkeye Machinery Co., 1225 Walnut Street, Des Moines, for the entire state of Iowa.

Empire Equipment Company, 828 N. Main Ave., Sioux Falls, S. D., the entire state of South Dakota. (Empire also operates sales offices in Rapid City and Aberdeen, S. D.)

Newlin Machinery Company, 641 Southwest Blvd., Kansas City, Kan., for western Missouri and all of Kansas.

D. E. Newton

Douglas E. Newton has been appointed general sales manager in charge of sales and sales promotion for Denver Equipment Company, manufacturers of ore dressing and process equipment.

Mr. Newton joined Denver Equipment Company in 1939, and has worked variously with the engineering, order, ore testing, advertising and sales divisions of the company. He became manager of the Western Sales Division, and for the last two years has been in charge of the Denver Equipment Company manufacturing plant in Colorado Springs, Colo.

Before asuming his new duties, Mr. Newton completed a tour of Europe, Africa, South America, and Canada, to meet many of the company's foreign customers and to familiarize himself with the operation of Denver Equipment Company's branch offices and subisidiary companies.

FOR YOUR FEEDING, CONVEYING AND SEPARATION PROBLEMS

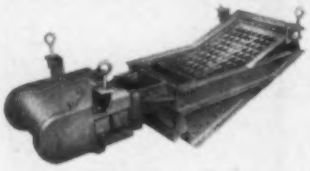
SYNTRON

WILL HANDLE — most all types of Bulk materials — from light, fine powders to heavy, coarse lumps—hot or cold—wet or dry.

AT — variable controlled rates from pounds to hundreds of tons per hour.

TO — crushers, driers, ball mills, belt conveyors, etc.

VIBRATORY FEEDERS
Up to Hundreds of Tons per Hour — Rheostat Control of Flow



VIBRATING SCREENS
Wet or Dry — Single or Multiple Decks

VIBRATING GRIZZLIES
Both Feed and Scalp With One Unit

LONG "Vibratory" CONVEYORS
No Motors, Gears or Other Mechanical Wearing Parts

3600 vibrations per minute move bulk materials at the desired rate — a turn of the control knob provides from a trickling dribble to a gushing torrent — over plain troughs, grizzly bars or screen sections. No gears, cams, speed reducers, etc.

Write for literature

SYNTRON CO.

385 Lexington Avenue **Homer City, Pa.**

The Broderick & Bascom Rope Company has acquired the entire stock interest of the Broderick family, and John K. Broderick and Arthur L. Broderick have retired as president and vice-president, respectively, and as directors. Charles E. Bascom has been elected president of the company and Joseph H. Bascom has been elected first vice-president and secretary-treasurer. These officers and J. F. Hedding of Pittsburgh constitute the new board of directors.

The Bascoms will continue in active management of the rope company, which will celebrate its 75th anniversary next year. The business was started by Joseph D. Bascom and John J. Broderick as a partnership in 1876 and was incorporated in 1882. Charles E. Bascom has been connected with the company for 48 years and for 30 years has been secretary-treasurer. Joseph H. Bascom joined the organization nine years ago and has been production manager in recent years. As son and grandson of Joseph D. Bascom, cofounder, the Bascoms represent the second and third generations engaged in direction of the company's affairs.

R. C. Bird

Ralph C. Bird, a sales engineer for the Williams Patent Crusher and Pulverizer Co., St. Louis, Mo., passed away unexpectedly on May 16 while traveling. Death occurred after a heart attack which he suffered in Jackson, Miss.

Mr. Bird had been connected with the portland cement and equipment industries all of his adult life. He had been affiliated with the Williams company since 1936. Membership in the American Society for Testing Materials dated from 1922. Mr. Bird was 64 years of age at the time of his death.

According to recent announcement, Poor & Company, makers of railroad track maintenance equipment, have bought controlling interest in the Pioneer Engineering Works, Inc., of Minneapolis, Minn., which manufactures highway building machinery.

In a statement made by Fred A. Poor, chairman of the board, it was indicated that the purchase of the common stock of Pioneer was financed by an undisclosed amount of cash and $2,000,000 of debentures, privately underwritten by insurance companies and banks, the debentures to mature serially to 1965.

Mr. Poor stated that no changes in the operating management of Pioneer are contemplated.

Promotion of Don Anderson to sales manager of the pump department has been announced by The Jaeger Machine Co., Columbus, O. He has been with the department for 15 years.

TOPS IN QUALITY!

J-M INDUSTRIAL FRICTION MATERIALS more than meet the high-quality standards specified by the leading manufacturers of heavy-duty earth-moving equipment.

TOPS IN PERFORMANCE!

Operators who put their machines out on the job must rely on equipment that can take it—that's why they rely on J-M INDUSTRIAL FRICTION MATERIALS to keep equipment operating on the job.

Manufacturers . . . operators—if your business has to do with shovels, cranes, hoists, or similar industrial equipment, you owe it to yourself and your organization, to *know* all about J-M Friction Materials. Here are rugged clutch and brake materials that are designed to move and stop bigger loads at higher speeds . . . to give you more hours of higher performance at lower cost. Write today for your copy of "Johns-Manville Industrial Friction Materials," that will give you the details—Johns-Manville, Box 290, New York 16, N. Y.

JM

Johns-Manville

INDUSTRIAL FRICTION MATERIALS

No. 1 With Leading Manufacturers

personal mention

GEORGE K. FOSTER, who was for the last four years manager of the Jeffrey mine of the Canadian Johns-Manville Co., Ltd., at Asbestos, Que., has been named production manager of the firm's Asbestos Fibre Division, with headquarters in Montreal. Succeeding him as manager of the Jeffrey mine is KARL V. LINDELL.

Mr. Foster joined the firm as a mine consultant in 1939. In 1944 he became chief engineer of the Mine Division, and a year later manager of the Jeffrey mine and a vice-president of the company.

Mr. Lindell became associated with Johns-Manville in 1945 as underground mine superintendent at the Jeffrey mine. In the following year he was advanced to the post of plant engineer. Before joining Johns-Manville Mr. Lindell was affiliated with the International Nickel Company of Canada, Ltd.

Any MICHIGAN owner will tell you

—why he bought a Michigan Truck Excavator. It could have been Michigan's famous mobility . . . the heavy duty Michigan truck chassis . . . high yardage through air controlled clutches . . . cast steel turntable base . . . hook rollers . . .

But why not let a Michigan owner tell you in his own words. Your local Michigan dealer welcomes the opportunity to show you the most complete line of ⅜ and ½ yard excavators available. It will pay you to get in touch with him *today*.

MICHIGAN
POWER SHOVEL COMPANY
315 Second Street
Benton Harbor, Michigan, U.S.A.

SAMUEL L. CRIBARI, 30 years ago an office boy for the Marquette Cement Manufacturing Company, was recently elected a vice-president of that company. He will continue to be in charge of all sales divisions of Marquette and its subsidiary companies, a function he has handled for seven years as assistant to the president.

S. L. Cribari

After a seven-year apprenticeship as office boy, during which he attended night school, Mr. Cribari was made assistant credit manager in 1927. Three years later he became southern credit manager in Marquette's Memphis, Tenn., office. In 1933 he returned to the company's general offices in Chicago as credit manager. Two years later he was appointed assistant treasurer, and in 1943 he became assistant to the president, charged with full sales responsibilities.

CARL J. LOFSTEDT, who was formerly general operating manager for the Pennsylvania-Dixie Cement Corporation, recently returned to the United States from Iran and a tour of western Europe.

C. J. Lofstedt

While he was in Iran, Mr. Lofstedt completed the outline of an expansion program for the Iranian cement industry.

Five new appointments in the roofing granule division of the Minnesota Mining & Manufacturing Co., St. Paul, Minn., have been announced.

MAURICE E. BUZZELL, formerly the division's chief chemist, was named technical director. Mr. Buzzell joined the 3M organization in 1934 as a process engineer.

New research and development manager of the division is HOWARD B. BURTON, who started with the firm in 1935 as a ceramic engineer and was supervisor

of product research prior to his promotion.

JOHN A. BROWN, the company's chief geologist, assumes the additional responsibility of "allied products" manager of the roofing granule division.

The division's former quality control supervisor, GEORGE D. GADBOIS, is now products control manager. He started with Minnesota Mining in 1929 as an abrasives inspector.

PAUL N. COATES becomes development engineer for road surfacing and related rock products. Mr. Coates was project coordinator in 3M's new products division prior to this appointment.

Appointment of ALLEN H. UHLER to be plant manager of the Lehigh Portland Cement Company plant at Alsen, New York, has been announced by Roy N. Young, vice-president and operating manager. The appointment was effective April 1, 1950.

Mr. Uhler succeeds E. L. SNYDER, who has retired. Mr. Snyder has been in

E. L. Snyder

A. H. Uhler

charge of the plant since 1925, when it was purchased by Lehigh. His career there began in the laboratory and spanned almost 48 years under different owners. The reconstruction and modernization program completed in 1940 was carried out under his supervision.

Mr. Uhler was employed by Lehigh in 1940, trained at the Ormrod laboratory and placed at the Alsen plant. During World War II, Mr. Uhler served in the Army Air Corps, 1942 to 1946. He became chemist in 1947 and was acting plant manager in any absence of Mr. Snyder.

Effective May 1, 1950, the following changes in personnel were announced by the Ideal Cement Company of Denver:

F. W. CALVERT, Northern Division sales manager, retains his post as sales manager of the Colorado Division.

A. C. CRAIG, assistant sales manager, Colorado Division, for the Denver office.

E. A. KNOWLES, assistant sales manager, Colorado Division, for Colorado.

R. C. POLLARD, assistant sales manager, Colorado Division, for New Mexico.

GUY FRIDAY, assistant superintendent of the Portland plant.

GLENN HORLBECK, assistant superintendent of the Ada plant.

Election of ANTHONY POPE as president of the Colonial Sand & Stone Company of New York City was announced

THIS SLATE ELECTS NAYLOR PIPE FOR MINING SERVICE

It's just simple arithmetic to find out what pipe best fills your needs in mining service.

add:

HYDRAULIC LINES
+ "HIGH" AIR LINES
+ WATER LINES
+ VENTILATING LINES
+ TAILINGS LINES

NAYLOR PIPE

The Right Answer is . . .

The proving factor is Naylor's exclusive Lockseam Spiralweld structure which makes Naylor Pipe stronger, safer . . . superior to ordinary lightweight pipe in mining service. Sizes from 4" to 30" in diameter with all types of fittings, connections and fabrications.

Write for Catalog No. 44

NAYLOR PIPE COMPANY
1257 East 92nd Street, Chicago 19, Illinois
New York Office: 350 Madison Avenue, New York 17, N. Y.

Baughman

The HI-SPEED Belt and Bucket Elevator that costs less to own and cuts your operating expense

FOR QUARRIES . . . BLOCK PLANTS . . . BATCH PLANTS . . . PRE-MIX PLANTS . . . CEMENT PLANTS . . . YARDS

Built by production line methods to slash manufacturing costs! Standard length sections and head and boot assemblies are adaptable to the requirements of any permanent or temporary installation.

Large capacity . . . heavy duty. Lifts sand, gravel, other aggregates from 20' to 80'—up to 90 tons per hour. Ruggedly built of high tensile alloy steel.

MOVE *Baughman* CONVEYOR TEAMS ANYWHERE!

Whatever your materials handling problem, BAUGHMAN has the answer. There are unlimited variations and combinations possible in BAUGHMAN equipment — horizontal belt conveyors to any length . . . heavy duty, light duty and inclined elevators . . . auger type and belt type conveyors adjustable to any angle. All equipment is either completely portable or easily disassembled for re-location at any time.

MODEL Q AUGER CONVEYOR

Loads, unloads, conveys any material that becomes fluid in movement . . . from the horizontal to 60°. Volumes from 15 to 50 cu. ft. per minute depending on material conveyed. Positive direct drive. For portable or stationary installations. Available with or without wheels . . . with hopper or in combination.

MODEL 230 BELT CONVEYOR

Another "Hi-speed" product that's long on service and short on price. Pre-fabricated by assembly line methods . . . assembled from standardized units. Result: a ruggedly built conveyor you can well afford to buy. Conveyor illustrated is 30' long, composed of one 20' section, one 7' tail and one 3' head section, from stock. Gasoline or electric power. Portable or stationary.

● *WRITE for information on full line of conveyors and BAUGHMAN self-unloading bodies and spreading equipment.*

BAUGHMAN MANUFACTURING CO., Inc.

871 Shipman Road, Jerseyville, Illinois

"There is a Baughman Distributor Near You"

recently by company officials. Mr. Pope succeeds his father, the late Generoso Pope.

Fortune Pope, a brother, was elected executive vice-president and secretary, and Generoso Pope Jr. was named vice-president and treasurer.

Named to the board of directors was Mrs. Generoso Pope Sr., who will fill the vacancy caused by the death of her husband.

At the annual meeting of stockholders of Harbison-Walker Refractories Co. five new vice-presidents were elected, as follows:

F. H. Atwood, G. F. Cronmiller, Jr., W. F. Rochow, H. L. Smalley, and E. T. Hile. E. A. Garber, Harbison-Walker president and general manager, and W. F. Bickell, treasurer, were re-elected, and W. F. Godejohn, formerly vice-president in charge of operations, was made senior vice-president of the company.

J. E. MacCloskey, who has been chairman of the board, declined re-election, but will continue as a director and general counsel for the company.

James P. Raugh was elected a vice-president of the General Refractories Company at a recent meeting of its board of directors. Mr. Raugh was graduated from the United States Naval Academy in 1926 and joined the General Refractories sales force in 1928. After active duty in the Navy during World War II. he returned to Grefco in 1945 as general works manager, a position which he occupied until his recent promotion.

The United States Testing Company, Inc., has announced the addition of John F. Podger to its staff. Mr. Podger is considered a leading world authority in mica mining, processing, and grading. In his 40 years in the mica field he has operated mines in India, Peru, and Argentina. He was mica inspector for the government of India during the last world war and a member of the Bihar Orissa Legislative Council on mica. Prior to his association with the United States Testing Company he was mica adviser to the Indian Trade Commissioner in London.

David H. Deacon has been appointed assistant sales manager of the Dayton, O., territory of Universal Atlas Cement Company, it was announced by A. C. Cronkrite, vice-president, Central Region, of this U. S. Steel subsidiary.

Mr. Deacon joined Universal Atlas in October, 1941, as clerk in the Albany, N. Y., sales office. There he became a salesman in January, 1942, and served in this capacity until he enlisted in the U. S. Army Air Force. At the conclusion of the war he rejoined Universal Atlas at the Albany office as sales representative. Six months later, he was assigned to the cement company's Dayton sales office, where he has since served as sales representative.

HUGH C. LAND, assistant to the production manager of the Pennsylvania Salt Manufacturing Company, has been appointed production manager.

In his new capacity Mr. Land will exercise general supervision over operation of the manufacturing facilities in the parent company, including utilities. Following his graduation from the University of Denver, Mr. Land joined a consulting engineering firm in Denver. Later he was associated with the Maclear Manufacturing Company of Denver as assistant general manager.

During World War II Mr. Land served with the Chemical Warfare Service. He was chief of the maintenance division at Denver when he resigned in 1946 to join the Pennsylvania Salt Manufacturing Company at Wyandotte.

At this plant he was in charge of maintenance and later was named assistant superintendent. Since January 1, 1949, he has been assistant to the production manager in Pennsalt's Philadelphia offices.

Two appointments in the operating department of Universal Atlas Cement Co. were announced recently.

Effective March 1, 1950 ARCHIE H. ADAMS, assistant plant manager, Fairborn, O., became assistant plant manager of the company's largest plant at Buffington, Ind. THOMAS J. GRIFFETH, maintenance engineer at the Hannibal, Mo., plant succeeded Mr. Adams as assistant plant manager at Fairborn.

Mr. Adams joined the cement company in 1936 as Operations Clerk at Leeds, Ala., plant, where he later became chemical engineer. From 1942 until 1946, Mr. Adams served as a commissioned officer in the United States Navy. Shortly after rejoining Universal Atlas he became assistant plant manager at Fairborn, which position he has held until his present appointment.

Mr. Griffith was graduated from the Missouri School of Mines, Rolla, Mo., in 1940. From 1940-45, he was associated with the Newport News Shipbuilding and Dry Dock Co., Newport News, Va. He joined Universal Atlas as maintenance engineer and supervisor of safety and personnel in 1948, and served in this post until his recent promotion.

BENTON M. BAILEY has been appointed superintendent of the W. H. Loomis Talc Corporation's mine at Gouverneur, N. Y. Mr. Bailey is a mining engineer and has had many years' experience in hard rock mining. He will serve as assistant to LeRoy Brown, general superintendent.

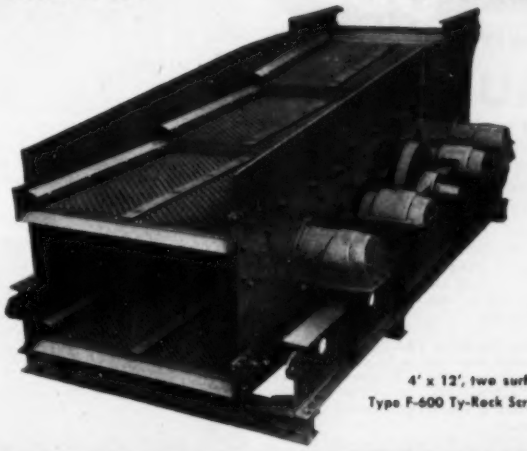
H. WARD LEWIS, RALPH E. LARRY, J. N. SULIOT, and H. W. GIBBS have been promoted to new duties by Pittsburgh Limestone Corporation, a U. S. Steel subsidiary.

Mr. Lewis, who has been supervisor of operations at the firm's plant at New

YOU CAN DEPEND ON

TY-ROCK SCREENS

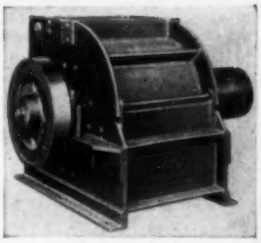
BALANCED RUGGED



4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

UNIFORMITY



Impact Breaker and Pulverizer. One piece welded steel frame of ¾ inch plate. Manganese hammers and breaker plate. Replaceable liners. Heavy duty S-K-F spherical, roller bearings. Comes in three sizes — 12-16, 12-24 and 36-42.

That's what this EAGLE Pulverizer produces—particularly in agricultural lime—uniform results. And it's designed and built in such a way that it will do just that, economically, for *years*!

A request on your letterhead will bring you details by return mail. Dept.550.

EAGLE

JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

CRUSHER CO., Inc. GALION OHIO-U.S.A.

Only a 1-Man JOB WITH A SAUERMAN POWER SCRAPER

In the above picture, a Sauerman Power Drag Scraper is making a deep cut into a hill and moving material 400 ft. to hopper, handling an average of 2,000 cu. yd. a day. Operator has finger-tip control of the scraper and shifts it from side to side.

SAVINGS in equipment cost, time and labor are your direct gains on dig-and-haul or stock-piling jobs with a Sauerman Power Drag Scraper.

ONE-MAN CONTROL, fast action. Reaches across a river, pond, pit or stockpile, or to top of hill — moves material from any point within cable radius, and dumps automatically wherever desired.

Whether you handle a few tons a day, or many thousand tons, we can supply size and type of equipment that will meet your requirements economically. It will be built to give you years of service and require little by way of repairs.

LET US SHOW YOU — WRITE FOR CATALOG ILLUSTRATING INSTALLATIONS HANDLING ALL KINDS OF MATERIALS.

This picture shows how a cement maker uses a simple Sauerman installation to handle a stockpile of clinker on ground facing grinding mill. Scraper tail block is hooked into U-bolts set into building wall.

SAUERMAN BROS., Inc.
534 S. Clinton St. Chicago 7, Ill.

PYRASTEEL

PYRASTEEL's amazing record of service is demonstrated by the old type Kiln Ring, shown at left, which withstood high temperatures in a large cement plant in Dallas, Texas, for over 14 years.

This solid ring casting, recently scrapped, weighed 4200 lbs. Today's segmented type Kiln End of the same size would save at least one ton in weight, and about $1000 in cost.

Over 76% of the annual cement output is produced in plants that now are using either or both of our alloys, PYRASTEEL and EVANSTEEL.

Durable PYRASTEEL Kiln Ends enable modern cement plants to avoid costly burnouts and shutdowns.

PYRASTEEL is economically adapted for many other high-heat applications, including conveyor screws, clinker coolers, feed pipes, drag chains.

Write for PYRASTEEL Bulletin

CHICAGO STEEL FOUNDRY CO.
Kedzie Ave. & 37th St., Chicago 32, Ill.
Makers of Alloy Steel for Over 40 Years

We invite You to visit our BOOTH #2003 at the CHICAGO METAL SHOW October 23-27

Castle, Pa., became manager of operations. Mr. Larry, a vice-president, has been transferred from New Castle to the company's general offices in Pittsburgh.

Mr. Suliot is now assistant to the manager of operations at New Castle, and Mr. Gibbs succeeds Mr. Suliot as superintendent of the company's Moler Dolomite Quarry at Millville, W. Va.

FRANK E. PARSONS has been appointed to the staff of the National Mineral Wool Association as technical engineer. Mr. Parsons was formerly vice-president, director, and general manager of Insulation Industries, Inc., Janesville, Wis.

ROBERT S. GERSTELL, vice-president of the Alpha Portland Cement Company of Easton, Pa., and Chicago, Ill., was recently elected president of the Hotel Easton Company.

ROY F. O'MARA, vice-president of the Allegheny Asphalt and Paving Company, Inc., Pittsburgh, Pa., has been elected president of the Constructors Association of Western Pennsylvania.

GEORGE H. DONALDSON has been appointed assistant general manager of The Carbon Limestone Company, Lowellville, O. Before accepting this post, Mr. Donaldson was vice-president and general manager of The Machined Steel Casting Company at Alliance, O., which discontinued operations in March of this year.

Appointment of J. C. POTTS as consulting engineer for the Washington Brick & Lime Company has been announced by company spokesman at Spokane. Mr. Potts will be in charge of several new products being developed.

EDWARD M. HENDERSON of Catskill, N. Y., sales representative for North American Cement Co. for 25 years, was presented a certificate and watch in honor of his long service at a luncheon in the DeWitt Clinton Hotel, Albany, N. Y. Among those attending the meeting were George B. O'Brien, Albany district sales manager of the company, and Roy S. Adkins, New York City sales manager.

HARRIS N. SNYDER, vice-president and general manager of Buffalo Slag Co. Inc., Buffalo, N. Y., has been elected to the board of directors of the reorganized International Railway Company, a city transit firm.

JOSEPH H. PENNINGTON, formerly assistant chemist at the Alsen plant of the Lehigh Portland Cement Company, was recently promoted to supervising chemist and engineer. Mr. Pennington has been with Lehigh since 1946.

legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Recently, a reader wrote an interesting letter, as follows: "For several years I have read with a great deal of interest your legal reports in PIT AND QUARRY. At one time you gave me a list of higher court decisions which greatly assisted our lawyer to win a lawsuit for me. Now, I have another legal problem. A few weeks ago while I was ill at my home, one of my employees signed a contract to purchase certain badly needed equipment. He thought I had previously ordered the equipment and signed the contract believing it was only on approval for quick delivery. I do not want this particular equipment, but the manufacturer threatens suit if I refuse to pay for it. Can the manufacturer compel me to pay for the equipment? Also, am I liable for the signature of my employee? Please explain when an employee can bind or obligate me on his contract. Also, when is the employee liable on contracts he signs, instead of my being liable?"

The answers to these questions are important to all readers. Hence, I shall review the law in these pages. First, it is important to know that an employer always is liable on the contract signed by an employee. The employer is legally obligated to pay the contract price if the testimony proves that the employee was a "general agent" for the employer. This is so because the courts classify employees as either "general" or "special" agents. Generally speaking, an employer is liable for all acts of his "general" agents, but he is responsible for *only* such acts that a "special" agent performs within the actual scope of the authority given him. Here is an important rule by which to determine whether an employee may make a valid contract which binds his employer: (1) A "special" agent can make a valid contract only within the limit of the authority given him by the employer; (2) persons dealing with an ordinary or "special" employee must inquire and use care to determine the extent of his authority before a contract signed by the employee binds the employer, but this is *not* true when the employer puts an employee in a position as a manager; (3) when the employer gives authority to an employee to manage business or its department, the employee immediately becomes a "general" agent who may bind the employer on all contracts relating to the business; (4) an ordinary employee as a bookkeeper, salesman, truck driver, stenographer, or the like, is a "special" agent, and his authority is limited; the employer is not liable on contracts made by such a "special" agent unless the employer has given him unusual or broad authority; (5) any employee can have broad authority if the employer notifies persons with whom the employee intends doing business that the employee has unusual authority; (6) an employer is liable for contracts signed or made by any employee placed in a position where a reasonably careful person is caused to believe that he has proper authority to bind his employer. This law is applicable to all employers, and all kinds and classifications of contracts.

For instance, in *Service v. Modica*, 139 So. 80, it was disclosed that the owner of a business left an employee in charge of the business. A salesman called on the employee and prevailed upon him to sign a contract involving a considerable sum of money. Later the business owner

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and employer refused to pay the bill on the contention that he had not given the employee authority to enter into contracts of this nature. However, the higher court held the employer liable, and stated the following important law:

"A party dealing with an agent, acting within the scope of his authority, is regarded as dealing with the principal..."

This court explained that when the employer left the employee in full charge of the business, the employee automatically became a "general" agent and the employer was liable for all acts and contracts made by the employee relating to the employer's business. This court also explained that an employer may temporarily leave an ordinary employee in charge of the business and not be liable on contracts or agreements made by him. Under these latter circumstances strangers are duty-bound at their own peril to inquire regarding the authorized authority of the employee before contracting with him.

Also, in *Morgan v. Cedar Grove Concrete Company*, 41 So. (2d) 521. Here the evidence proved that the president and general manager of a corporation made a contract with a purchaser. Later the corporation refused to fulfill the terms of the contract, and the purchaser sued to recover damages.

It was contended that the sale contract was invalid because the president, who signed the contract, had no authority to obligate the corporation, since he was not authorized by resolution of its board of directors to make the contract.

Nevertheless, the higher court held the corporation liable for breach of contract, and said, "The contract in the instant case was in the scope of defendant's (corporation's) business. The contract was one which was within the apparent or implied authority of Spencer, as president and general manager of the corporation."

In other words, it matters not what the employee himself says as to his authority to bind his employer on contracts. The important testimony is whether actually the employer either gave the employee authority to bind him, or placed the employee in such position that a reasonably careful person would have justification in believing that the employee actually had authority to bind the employer.

Employee's Personal Liability

Very frequently the circumstances are such that the employee himself and not the employer is liable on a contract which the employee signs for his employer.

The law books are full of cases where innocent persons were held personally liable for contracts signed while intending to obligate their employers, or other persons. It is certain that unless the signer clearly and unmistakenly indicates that he himself will *not* be personally liable on a contract signed for another, he can be held responsible.

For example, in *Marx v. Searman*, 43

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So. (2d) 146, the testimony showed facts, as follows: A person named Spearman signed a contract with one Jack Joyce who owned the Dauphine Theatre. This contract specified that Spearman would remodel the theatre building for the purpose of conducting an ice floor show therein. In this contract Joyce agreed to pay Spearman 50 percent of the net profits derived from paid admissions, concessions, and other revenues from the operation of the theatre.

A short time after this contract with Joyce was signed, a letter was written on the stationery of Jack Joyce and addressed to a contractor. This letter stated, "Please accept this as our official order" for installation of ice equipment for cooling and making ice in the building. This work involved a considerable amount of concrete work. The letter further read: "Payment in full to be made within 5 days completion of job." This letter was signed:

"The Riviera Theatre Club
"E. Spearman".

Pursuant to this letter, the contractor installed the ice skating rink, furnishing all necessary labor and material. The cost of the work was $5,023. After only a few performances had been staged, the venture failed and it was closed. Neither Spearman nor Joyce would assume responsibility for paying the contractor, who filed suit to collect $5,023. This question was presented the court: Who is liable for payment of the $5,023 cost for installation of the ice skating rink?

The testimony showed that Jack Joyce owned and operated Joyce's Riviera Theatre Club on whose stationery the order was given the contractor to do this work. On the other hand, this order was signed by Spearman, *who did not* stipulate that he was signing the contract for Joyce. Spearman admitted signing the contract, but contended that he signed the contract as a courtesy to Jack Joyce.

In subsequent litigation the higher court held *Spearman personally* liable on the contract, and said:

"Counsel are correct as to their contention that the evidence affirmatively shows that Spearman was not the owner or proprietor of the theatre club, but it does show that he executed the contract and bound himself personally for the full payment of the work performed thereunder."

Spearman could have avoided personal responsibility on this contract or letter had he signed it, as follows:

"The Riviera Theatre Club,
By E. Spearman, as agent".

Loaned Employee Is Injured

Considerable discussion has arisen from time to time over the legal question: If an employer loans his paid employee to another, who is liable for damages caused by negligence of the employee, or for injuries to the employee? The answer is: The one who has authority to direct the employee what work to do is liable.

For illustration, in *Hahn v. Bucyrus-Erie Company,* 178 Fed. (2d) 844, it was shown that the Fauzio Company purchased a walking dragline excavator from the Bucyrus-Erie Company. The contract of sale provided that Fauzio Company was to erect and operate the machinery, furnishing all labor, material and supplies needed, and that the seller was to lend them an experienced engineer to superintend the erection and initial operation of the machinery. The contract also provided that the seller would pay the engineer's wages, but that officials of the Fauzio Company would direct the engineer as to the work.

An employee of the Fauzio Company was seriously injured when the premature signal was given by the engineer for a crane operation, during the work of erection. The injured employee sued Bucyrus-Erie Company, the seller, for damages.

In view of the fact that the engineer, whose negligence caused the injury was under direction and control of the Fauzio Company, the jury refused to hold the Bucyrus-Erie Company liable although the testimony showed that the latter was paying the engineer's wages at the time the injury occurred. The higher court approved the verdict, saying:

"The question turns upon whether Fenner (engineer) was so loaned as an employee by the defendant (Bucyrus-Erie Company) to Fauzio Company that the latter had he exclusive right to direct and control him at the time of the accident . . . This was clearly a question of fact for the jury to determine from all the evidence including that contract."

Impossible to Deliver

According to a recent higher court, the fact that a seller of nonmetallic products finds it is impossible, for reasons over which he has no control, to deliver merchandise according to the terms of his contract will *not* afford him any relief or immunity from payment of damages to the purchaser.

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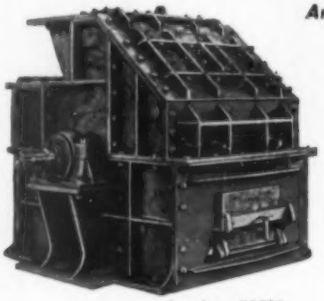

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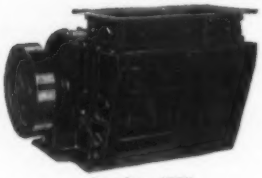

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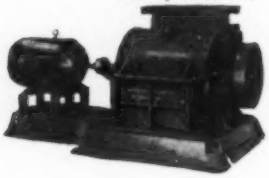

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For example, in *Concrete Appliances Company v. Queen, Inc.*, 36 N. W. (2d) 121, the testimony showed that a seller signed a contract to deliver to a purchaser certain merchandise at an agreed price. The seller failed to comply.

The higher court held that although the seller was unable to procure the merchandise to fill the order, this excuse did not relieve him from liability.

The court held that the purchaser was entitled to recover damages from the seller in an amount equal to profits he would have earned on resale of the merchandise. This court explained further that usually the proper measure of damages for breach of a sale contract is the difference between the contract price and the price at which the merchandise could have been obtained from another seller on the date the contract was breached. Or the purchaser may sue and recover the anticipated profits.

Can't Sue United States

It has long been settled law that the United States may terminate contracts without answering in court for damages. This is so irrespective of whether there is a termination provision in the contract. According to a recent higher court, a company cannot expect to recover damages because of termination by the United States of war contracts, unless the provisions of the Contract Settlement Act are strictly followed. This is so because the Contract Settlement Act and the war Mobilization and Reconversion Act were designed "to promote the orderly termination and settlement" of war contracts.

For example, in *Monolith Portland Midwest Company v. Reconstruction Finance Corporation*, 178 Fed. (2d) 854, the testimony showed facts, as follows: A contract was made in 1943 between the Monolith Portland Midwest Company and Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation. The Defense Plant Corporation agreed to furnish the money necessary to construct and operate a plant. In 1945, the Reconstruction Finance Corporation dissolved the Defense Plant Corporation and succeeded to its rights and liabilities under the contract. In 1946, when the plant was nearing completion, the Reconstruction Finance Corporation terminated the contract. Then the Monolith Portland Midwest Company sued the Reconstruction Finance Corporation in the United States Court and asked for either possession of the plant, plus $516,000 to complete it, and $1,200,000 to make a test run, or $7,500,000 with which to build and operate another plant; and for reimbursement for expenses incurred before the termination of the contract, to-wit, $197,524,76, together with interest. The higher court refused to hold in favor of the Monolith, saying:

"An orderly and uniform system of handling claims was essential. Speedy settlements were necessary to provide contractors with the working capital to convert to other war production or to peacetime manufacture. The Settlement Act was designed to meet these needs."

traffic news

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 87585 (1)—Proposed to establish on slag, crude, granulated, crushed or commercial (a product of iron and steel furnaces) in bulk, in open-top cars, in straight or mixed carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Hamilton, O., to Batesville, Ind., Greensburg, Ind., 171 cents, and Evansville, Ind., 262 cents. Not subject to ExParte 162, 166 and 168 increases.

Docket 87586 (1)—Proposed to establish on slag, crushed or crushed commercial (other than granulated) in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Hamilton, O., to Kemp, O., 189 cents net ton.

Docket 87604 (2)—Proposed to establish on dolomite, stone, raw or crude, washed or not washed, having value for chemical purposes only, in open-top cars, carload minimum weight marked capacity of car used, from Woodville, O., to St. Louis, Mich., 174 cents net ton.

Docket 87625—Proposed to establish on stone, crushed; stone screenings, and limestone, agricultural, unburned; in bulk, in open-top cars; minimum weight 90 percent of marked capacity of car, except that when loaded to full cubical or visible capacity, actual weight will apply from Greencastle, Ind., to Haubstadt, Ind., 137 cents net ton and Evansville, Ind., 137 cents net ton.

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 87632 (1)—Proposed to establish a rate on crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car except that when car is loaded to full cubical or visible capacity, actual weight will

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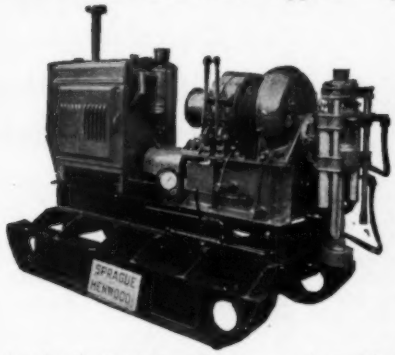

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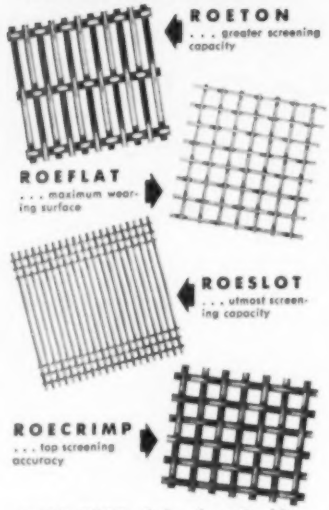

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GENERAL FREIGHT TRAFFIC COMMITTEE EASTERN RAILROADS

Bulletin G-1904 (Shippers)—It is proposed to establish on limestone, natural, ground or pulverized in bulk, in open-top equipment, carload minimum weight 90 percent of marked capacity of car from Buffalo, N. Y., to P.R.R. stations Fillmore, N. Y., Black Creek to Houghton, N. Y., and Rossburg to Portageville, N. Y., $1.80 per net ton, including ExParte 162-B, 166-C and 168-A increases.

Bulletin G-2013 (Carriers)—Proposed to establish on limestone, crude cement, not screened to size, in open-top cars, minimum weight 90 percent of marked capacity of car, from Annandale, Branchton, Harrisville and Osbornes, Pa., to Universal, Pa., $1.20 per gross ton, including all increases, in lieu of present rate of $1.36.

ILLINOIS FREIGHT ASSOCIATION DOCKET

IRC 511-948—Stone, crushed, in bulk; limestone, agricultural, unburned, in bulk in open-top cars; minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Lehigh, Ill., to representative Illinois points shown below:

To:	Present	Proposed
B&O		
Ficklin to Long Creek	86	153
C&NW		
Wheaton, Aurora, Feehanville, Barrington, Evanston	202	169
CMSTP&P		
Morton Grove, Main Street (Evanston), Evanston, Elgin	202	169
EJ&E		
Aurora	202	169
NYC&STL		
Paxton	153	120
TP&W		
Watseka, Leonard	156	123

Docket IRC 511-932-A—Stone, crushed, in bulk; limestone, agricultural, unburned, in bulk in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Lehigh, Ill., to representative destinations in Illinois shown below:

To:	Present	Proposed
Rosamond to Hillsboro	186	153
Peoria	186	153
Pekin to Twin Grove	172	129

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC 511-944 (MRP 5288)—Limestone, agricultural, in open-top cars, carload, from Hannibal, Mo., to stations on the Wabash Railroad in Illinois, as provided in Item 695-P, Supplement 213, Wabash Tariff I-16505 ICC 7321, Illinois stations, New Berlin, Ill., and west, also stations on the Keokuk branch, minimum weight as per Item 300-A, Wabash Tariff I-16505. Present: Basic rates published in Item 695-P, Wabash Tariff I-16505 are subject to increase of 15 cents per ton under X-162-B, 30 percent under X-166-C, and 10 percent under X-168-A. Proposed: Basic rates published in Item 695-P, Wabash tariff I-1605, to be increased 15 cents per ton for X-162-B

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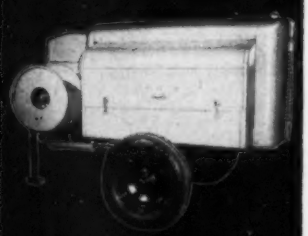

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and 10 percent, not subject to X-162-166-168.

PACIFIC SOUTHCOAST FREIGHT BUREAU PROPOSALS

Docket X 918 (Shipper)—Proposed to establish on limerock, crude, crushed, ground or powdered, in open-top cars, carload, from McColl, Calif., to Hamilton City, Woodland, Pittsburg, Tracy, Antioch, Manteca, Salinas and Spreckels, Calif., requested through commodity rates related to those in effect from other shipping points from which through rates on lime rock are in effect.

Docket 919 (Shipper)—Lime, common, carload, from Diamond Springs, Calif., request for the following rates per hundred weight, minimum 100,000 lbs.: to Phoenix and Tucson, Ariz., 38 cents; Reno, Nev., 19 cents; Red House, Neb., 27 cents; Twin Falls, Idaho, 42 cents; and Boise, Idaho, 48 cents.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 52244 (1)—Lime, (calcium) Houston, Tex., to Alma, Mich., establish rate of 74 cents per 100 lbs. (not subject to Tariffs X-162-166-168), minimum weight 30,000 lbs., and rate of 62 cents per 100 lbs. (not subject to Tariffs X-162-166-168), minimum weight 50,000 lbs.

Docket 52296—Proposed to establish on limestone, crushed or ground, a rate of $8.31 per ton of 2000 lbs., from Mosher, and Ste. Genevieve, Mo., to Winnipeg, Manitoba, Canada. This is present Rule 7 combination rate over St. Paul. Not subject to X-162-166-168 increases.

Docket 52452 (1)—Proposed to establish a rate on stone, consisting of irregular pieces, each weighing not more than 20,000 lbs., carloads of $2.40 per ton, minimum weight 90 percent of marked capacity of car, except that actual weight will govern when the car is loaded to full visible capacity, from Little Rock, Ark., to New Orleans, La. Rate not subject to 162-166 or 168 increases.

FREIGHT TRAFFIC COMMITTEE TRUNK LINE TERRITORY RAILROADS

Docket TL B-618 (Carriers)—Roasted dolomite (refractory dolomite in granular form, treated or untreated, clinkered or burned to a dead state) carload minimum weight 90 percent of marked capacity of car, from Millville, W. Va., to Harrisburg, Pa., $2.46; Steelton, Pa., $2.65; and Coatesville, Pa., $2.99 per net ton, including ExParte 162-B, 166-C and 168-A increases.

Docket TL M-619 (Shippers)—Limestone, crude, fluxing, foundry, and furnace, when loaded in bulk in open-top equipment, carload minimum weight 90 percent of marked capacity of car, from Annville and Palmyra, Pa., to Steelton, Pa., $1.00 per gross ton, including ExParte 162-B, 166-C and 168-A increases.

Docket TL-620 (Shippers)—Limestone, crude, fluxing, foundry and furnace, when loaded in bulk in open-top equipment, carload minimum weight 90 percent of marked capacity of car, from Shainline and Williams, Pa., to Bethlehem, Pa.,

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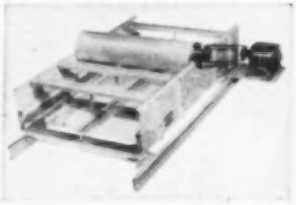

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ESTABLISHED 1881

$1.36 per gross ton, including 162-166-168 increases.

Docket TL M-627 (Carrier)—Proposed to establish on crude gypsum rock, in open-top cars, carload minimum weight 90 percent of marked capacity of car, but not less than 40 tons, to Alsen, N. Y., from Philadelphia, Pa., $2.97; Norfolk and Newport News, Va., $4.05 per net ton; and to Howes Cave, N. Y., from Norfolk and Newport News, Va., $4.65 per net ton, including ExParte 162-166 and 168 increases.

Docket TL M-651 (Shippers)—Proposed to establish on limestone, crude, fluxing, foundry and furnace, when loaded in bulk in open-top equipment, carload minimum weight 90 percent of marked capacity of car, etc., from Cedar Hollow, Pa., and Swedeland, Pa., to Bethlehem, Pa., $1.36 per gross ton, including all increases, in lieu of present rate of $1.44.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E 11-1216 (Shipper)—Crushed stone, carload minimum weight as provided in Item 70, CB&Q GFO 16060-A from Mordaunt, Mo., to destinations in Nebraska on CB&Q Railroad. Proposed—publish mileage scale of rates as shown below:

In Cents per Ton of 2000 lbs.

Miles	Rate*	Miles	Rate*
25	40	200	130
40	45	225	170
50	50	240	175
60	55	250	180
70	60	260	185
80	70	270	190
90	80	290	198
100	90	300	209
110	95	350	220
120	100	375	231
130	105	400	242
140	110	425	253
150	115	450	264
165	120	500	275
180	125		

*Subject to X-162-166-168 increases

Docket X-E-1220 (Shipper)—Proposed to establish a rate of 12 cents per 100 lbs. on stone, natural, rough quarried or sawed on four sides or less, not further finished. Minimum weight 100,000 lbs., from Winona, Minn., to Wisconsin Rapids, Wis. Rate not subject to ExParte 162, 166, and 168 increases.

Docket X-E-41-1218—Proposed to establish on sand and gravel, carload minimum weight 90 percent of marked capacity of car, except that when weight of shipments loads to full visible capacity of car is less than 90 percent of marked capacity of car, the actual weight will apply but in no case less than 40,000 lbs., from Fremont, Neb., Lyman-Richey Sand and Gravel Company pit located on C&NW Railroad 6.17 miles south of Fremont, Neb. To Sioux City, Ia., proposed 103 cents per net ton. Not subject to X-162-166-168 increases.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-1219 (Shipper)—Agricultural limestone, ground or pulverized in bags, barrels or in bulk, having value for soil treatment only, carload minimum weight, as provided in CB&Q GFO 19156-I from Mordaunt, Mo., to stations on the CB&Q Railroad in Iowa. Proposed—Mileage scale of rates shown as follows:

Miles	Open-Top Cars	Closed Cars
40	109	109
50	114	114
60	121	121
70	126	129
80	135	137
90	143	147
100	153	158
110	165	173
115	168	179
120	171	182
130	178	194
140	182	199
145	184	203
150	187	207
160	192	214
170	196	221
175	199	227
180	202	229
190	206	235
200	211	244

Rates in Cents per Ton of 2000 Pounds Not Subject to ExParte 162, 166 and 168 Increases

Docket T-41-1225 (Shipper)—Proposed to establish on stone, riprap, minimum weight 90 percent of marked capacity of car from Earlham, Ia., to Omaha, South Omaha, and Albright, Neb., 121 cents per net ton.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-1232 (Shipper)—Stone, crushed, carload, minimum weight 90 percent of marked capacity of car, except that when loaded to full visible capacity, actual weight will apply, from Mordaunt, Mo. Proposed—Representative points are shown below:

Proposed rate in cents per ton of 2000 lbs.*

To:	
Bedford, Ia.	70
Clearfield and Lenox, Ia.	79
Payne, Ia.	76
Shenandoah, Ia.	84

Subject to ExParte 162-166-168 increases.

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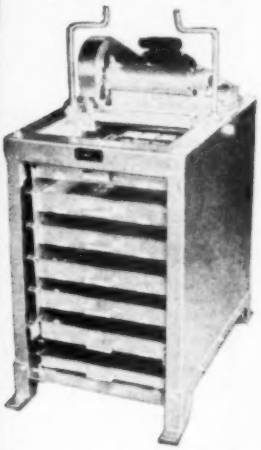

Handles up to one cubic foot of crushed stone, gravel, and similar materials. Performs 2 to 7 separations at once. Sizes coarse or fines from 4" to 200-mesh. Durable and economical. Write for details.

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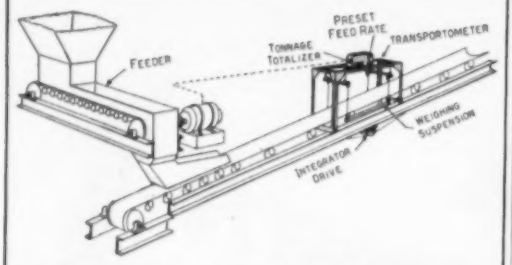

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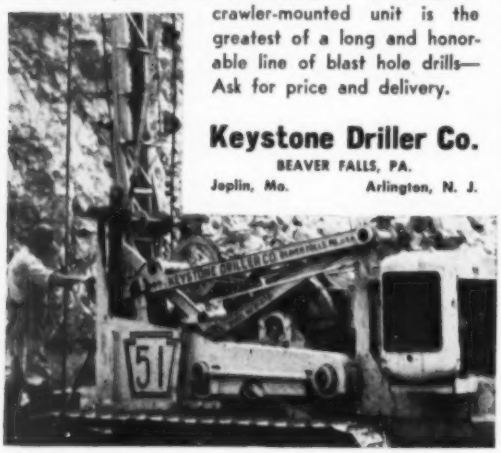

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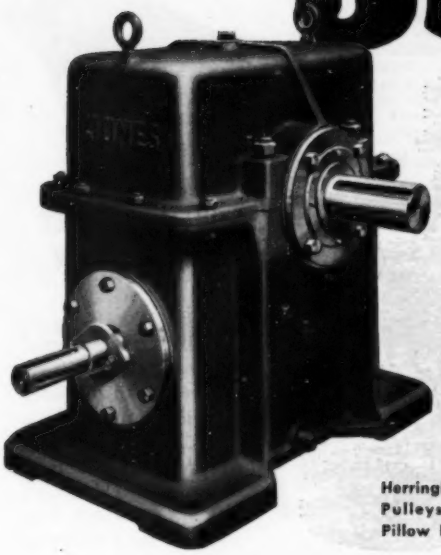

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They are built in ratios from 4 to 1 to 90 to 1 and in capacities from ¼ to 100 H.P.

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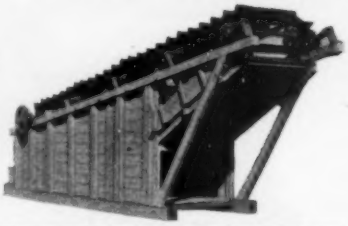

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The SuPREMIX Plastograph is a sturdy device built into the mixer to accurately measure the consistency or slump of concrete during the mixing cycle. The inches of slump of the concrete in the mixer can be determined at any moment during the mixing by glancing at a lever located on the exterior of the drum. When specified, this reading can be transferred to remote points and indicated by light signals. Further, when desired, the slump of each batch when dumped can be automatically recorded on charts.

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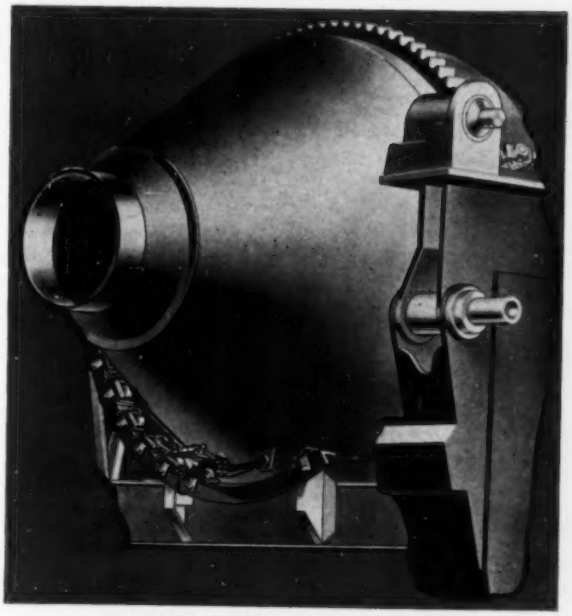

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Ready-Mix 'Incor' Concrete
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● One of New York City Housing Authority's largest projects is 2166-apartment Ravenswood Houses, Long Island City. Housing Authority projects are quality-constructed in every last detail—and they move ahead at driving speed. Because at today's costs, time saved is money saved—and how!

All last winter, frame concreting on the fourteen 6-story units in Ravenswood's west section clicked ahead on precise schedule—for CAYE CONSTRUCTION CO., INC. switched to 'Incor' 24-Hour Cement. In cold weather, column forms were stripped in 24 hours, slabs in 48 hours. That kept the job right on schedule—and saved a complete set of forms. *Big money, that, at today's form costs!*

Came Spring—and things were running so smoothly that they kept on using 'Incor'. For high-efficiency 'Incor' performance knows no season. Straight around the calendar, 'Incor' promotes the smooth-running, time-saving efficiency on which today's close-margin profits depend.

Another reason why the nation's leading Ready-Mix Operators make 'Incor'* concrete available at all times—for customers' time-and-money-saving convenience.

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NEWS OF CONCRETE MANUFACTURERS

Three Pipe Associations Form Joint Organization At Salt Lake City Meeting

On June 1 in Salt City a group of the manufacturers of concrete irrigation pipe and concrete drain tile formed the American Concrete Agricultural Pipe Association, a non-profit corporation in the State of Illinois, organized as a trade association to promote the interests of the concrete irrigation pipe and concrete drain tile industry.

The three national concrete pipe associations will coordinate their activities as members of a joint affiliating association known as "Concrete Pipe Associations, Inc." under the direction of Howard F. Peckworth acting as managing director of all three organizations. The headquarters of the concrete pipe industry associations is Suite 1364, Builder's Building, 228 North LaSalle Street, Chicago 1, Ill. The staff, in addition to Mr. Peckworth, consists of William A. Haley III, assistant to the managing director, John G. Hendrickson, research engineer, and three secretaries.

The officers of the three national concrete pipe associations are as follows:

American Concrete Agricultural Pipe Association: president, Gilbert D. Williamson, Valley Concrete Pipe & Products Company, Yuba City, Calif.; vice-president, J. W. Porter, Gifford-Hill-Western, Inc., Dallas, Tex.; secretary-treasurer, G. F. Lillie, Platte Valley Cement Tile Manufacturing Company, Scottsbluff, Neb.; director at large, E. L. Johnson, Concrete Conduit Company, Colton, Calif.

American Concrete Pipe Association: president, E. H. Fox, Cincinnati Concrete Pipe Company, Cincinnati, O.; first vice president, Hugh P. Ford, Eugene Concrete Pipe & Products Company, Eugene, Ore.; second vice-president, Harry Leuliette, Universal Concrete Pipe Company, Columbus, O.; third vice-president, G. W. Black, Black-Brollier, Inc., Houston, Tex.; secretary, G. B. Denham, Faulkner Concrete Pipe Company, Hattiesburg, Miss.; treasurer, J. D. Mollendorf, Illinois-Wisconsin Concrete Pipe Company, Chicago, Ill.

American Concrete Pressure Pipe Association: president, R. V. Edwards, American Pipe & Construction Co., Los Angeles, Calif.; vice-president, P. R. Hirsh, Lock Joint Pipe Company, East Orange, N. J.; secretary-treasurer, H. S. Price Jr., Price Brothers Company, Dayton, O.

Howard F. Peckworth

Detroit Products Assn. Now State-wide in Scope

The National Concrete Masonry Association's *Reporter* (May issue) noted a meeting of the Concrete Products Association of Detroit, held on April 24. President Hubert Moors and C. A. Sirrine, executive secretary, presided. Out-of-town notables present included E. W. Dienhart, N.C.M.A. executive secretary, and Fred W. Reinhold, a past president of N.C.M.A. Both took an active part in the discussions.

An important step was taken when it was decided to broaden the scope of the organization to give it state-wide coverage. An excellent representation of Michigan producers was in attendance.

Among other business of the evening concerned the general adoption of modular-sized concrete masonry units. Members favored the standardization of modular-sized units throughout the industry, and passed a resolution to that effect.

Harry K. Cain, Leader In Pipe Industry, Dies at 67

Harry K. Cain, president of the Continental Concrete Pipe Corporation of Chicago, died on May 23 at the age of 67 years.

In point of years of membership in the American Concrete Pipe Association, he was one of the oldest in the organization, having been a contemporary of George Sokol and Clare Bullen in 1907. He was vice-president of association during 1921, 1923, and 1924. Prior to that time, when the industry and the association experienced financial difficulties, he bore the entire financial obligation for the A.C.P.A. for one year.

Billner-Army Contract Executed for Use of Vacuum Concrete Process

Karl P. Billner, president of the Vacuum Concrete Company and inventor of the vacuum concrete process, recently announced in Philadelphia the execution of a general license with the United States Army for use of his vacuum concrete process. The contract covers a royalty rate to be paid for the use of the process in construction work by the Corps of Army Engineers and by any other building for the Army.

The Billner process removes excess water immediately after the concrete has been placed in the forms, which results, according to the inventor, in greater speed in drying and hardening, as well as greater strength and resistance to abrasion. This is the second blanket license made with a federal department by Mr. Billner. The first, executed with the Department of the Interior, has been in operation since 1940 for use in the construction of dams and other public projects.

Precast Units Developed To Cut Bridge Building Cost

A new development in small bridge construction and repair that uses precast concrete units is said to cut costs by as much as 30 percent and practically eliminates "detour time."

In new construction the process developed by Universal Concrete Pipe Company, combines precast concrete cribbing, deck slabs and bridge seats. A bridge of this type can be installed on the average secondary road in two days.

The precast bridge deck slabs weigh approximately 300 lbs. per lineal ft., or three tons for a 20-ft. section. Each slab has lifting holes placed at the center of gravity for easy handling. The average installation time from truck to bridge seat is about 15 minutes.

J. D. McClure Takes Post As Perlite Sales Manager For Great Lakes Carbon

J. D. McClure

J. Dwight McClure, previously Los Angeles division sales manager for permalite lightweight aggregates, has been promoted to manager of ore sales, a newly created position, according to an announcement by T. C. Carter, vice-president of Great Lakes Carbon Corporation.

In this new position Mr. McClure will contact perlite processors throughout the United States to make long-term arrangements for supplying them with prepared perlite ore. Great Lakes Carbon Corporation has just completed extensive facilities at Socorro, New Mexico, for preparing perlite ore to any specification desired.

Before coming to Great Lakes Carbon Corporation, Mr. McClure was with the Green River Corporation, Chicago, Ill. He was on active duty with the United States Navy from June, 1942, to November, 1945, serving as lieutenant commander. He will maintain headquarters at the company's executive offices, 18 E. 48th Street, New York, N. Y.

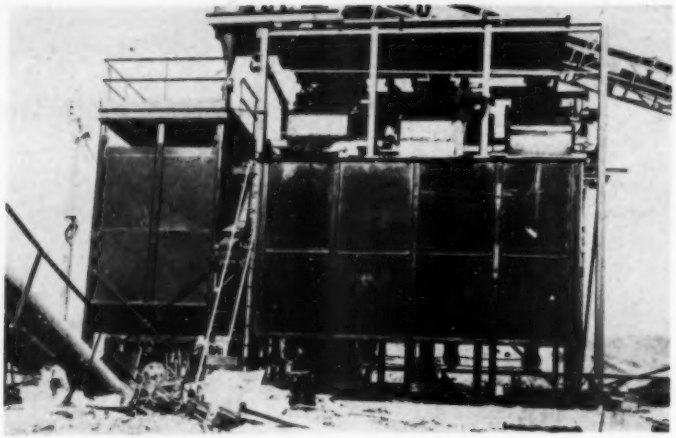
S. California C. M. Institute Formed by Eight Concerns

Intensive promotion of lightweight concrete blocks in the Los Angeles metropolitan area is the chief aim of the recently-formed Concrete Masonry Institute of Southern California.

M. E. Fitzgerald of the Consolidated Rock Products Company, heads the governing board of the new association. The eight charter member companies include the following: Consolidated Rock Products Co., O'Kelley-Eccles Co., California Homes & Materials Co., Angelus Concrete Block Co., Ward Concrete Products Co., Nemorco Block, Inc., Precast Concrete Products Co., and Pumi-Block Co. of (Santa Ana). All are volume producers of units employing lightweight aggregates of various kinds with the exception of Consolidated, which is the exclusive marketer in Los Angeles County of blocks produced by the Rocklite Co. of Ventura, Calif.

The institute is planning a broad program of advertising and close personal contact with architects, engineers, and builders in support of lightweight units in all types of construction. Later on it plans to employ a paid secretary to direct its campaign.

Carl Kilian has announced that construction is under way on the ready-mixed concrete plant of the Kilian Building Materials Company at Highland, Ill. Mr. Kilian has operated a ready-mixed plant for the last six years at Mascoutah, Ill.



Great Lakes Carbon Corp. Offers Sized Perlite Ore

T. C. Carter, vice-president of Great Lakes Carbon Corporation, has announced that volcanic perlite ore, prepared for furnacing to any specification is now available from the company's deposit at Socorro, N. M.

Over the last six months extensive facilities, including equipment for milling, screening, classifying and drying, have been installed to make this service possible. Large storage bins which will carry stocks of prepared ore have been provided. (See illustration.)

Great Lakes Carbon Corporation, reputed one of the major processors of perlite in the United States, claims that the Socorro deposit is one of the largest and purest known in the United States.

Big Block Machine Installed At Gulfport Concrete Plant

At Gulfport, Miss., in the plant of the Standard Block Company a new Appley-Yellen block machine (for which Standard now holds an exclusive franchise in southern Mississippi) recently went into production.

According to Virgil Howie, owner of the company, the new equipment will be used to make block composed of slag and Enslite, a new mixing substance manufactured by the Birmingham Slag Company.

The units are modular in dimensions, varying in size, and can be turned out at the rate of 500 per hour. Use of slag cuts the cost of the block, which is expected to provide a new type of economical building material for the Gulf Coast area.

Standard is a new acquisition of the former Logue Concrete Company and is managed by J. W. Howie, son of Virgil Howie.

Birmingham Slag Co. Opens Second Ready-Mix Plant

In full production at Birmingham, Ala., is the second of the ready-mix plants established by the Birmingham Slag Company of that city. (The older plant is located at Fairfield, Ala.) The new facilities serve the central, southern and eastern areas of the city and adjoining sections.

Using its new product, Enslite, an expanded crushed slag, the firm is now producing lightweight concrete masonry block, which is also noted for its great compressive strength.

Birmingham Slag processes 20 sizes of crushed and screened blast-furnace slag in its four plants, producing a total of 16,000 tons daily. Other slag products include SlagTex masonry units, made in numerous sizes and shapes; Enslag Colmix, a cold asphaltic concrete produced in five different types; and hot mixed asphaltic concrete.

Jerome Claims a "First"— A Mobile Ready-Mix Plant

Jerome, Idaho, is the base of a new industry, Titus, Inc., reported ready to go into production of ready-mixed concrete. Equipment consists of a moble weighing and batching machine with bucket conveyors and scales, a large mixer-loader mobile conveyor, and two new Ford F-6 trucks mounting 3-cu. yd. transit mixers.

Thus the city of Jerome will have what is said to be the first mobile unit in Idaho, since the plant can be moved to the job or to a point between several jobs. Manager of Titus, Inc., is Marvin Harp.

J. C. Stewart Heads Sales For Texas Dry Concrete Co.

John C. Stewart has been appointed sales manager for the Texas Dry Concrete Company of Fort Worth, a division of the Fort Worth Sand and Gravel Company, according to an announcement released by T. E. Popplewell, president.

Mr. Stewart will direct sales and promotional activity for Sakrete, pre-mixed concrete products. Formerly associated with the Builders Material Company, Mr. Stewart was affiliated in earlier years with the United States Gypsum Co. and the Texas Wallboard Co.

Transformation in Precast Concrete

NOT too long ago the Bahia-Mar Yacht Basin at Fort Lauderdale, Fla., was nothing more than a mangy little island dotted with a few scattered palm trees. Today, after the application of a generous dash of imagination, much engineering skill, prodigious quantities of precast concrete units, and about $2,500,000, the Bahia-Mar represents one of the finest and most complete yacht basins and resort recreation centers in the world. All types of supplies for sea-going pleasure crafts can now be purchased from the new shopping center on the island. To add to the beauty of this man-made paradise, the whole island has been landscaped with many varieties of tropical trees, shrubbery, and grass.

Docking facilities include berths and other appurtenances for approximately 500 craft, with water depths of 10 ft. at mean low level. Water, telephone, and electrical connections are available for all docked craft. All service lines are concealed in conduits in the piers.

The project required slightly more than 4,000 cu. yds. of concrete. Approximately 95 percent of the total yardage, including all piers, catwalks, bulkheads, posts, and utility docks, was precast and shipped about 10 miles to Bahia-Mar in barges. Lehigh hi-early strength cement was used exclusively on this job.

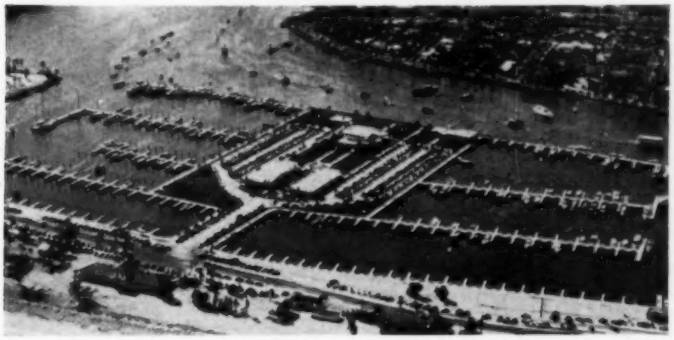
The precast concrete work was formed and placed under a subcontract awarded to Powell Brothers, Inc., Fort Lauderdale contractors. Handling of the precast sections, the largest of which weighed slightly over 4 tons, was accomplished with a special set of steel tongs.

The basin has 4,500 linear ft. of precast bulkheads consisting of reinforced T piles, spaced 9 ft. apart, between which were placed a reinforced concrete slab measuring 8 ft. by 9 ft. by 6 in. Poured-in-place 10- by 16-in. reinforced concrete caps completed the bulkheads.

Other concrete units precast in the Powell yards included 4,170 linear ft. of 10-ft. wide piers and 5,770 ft. of 5-ft. wide catwalks. The 10-ft. wide pier slabs were supported on 10-in. square concrete piles driven to approximately a 12-ton bearing. The slabs and piles were tied together by welding and reinforcing projecting from the pile to similar reinforcing bars projecting from a cut-out in the slab left for this purpose. Posts three ft. high were then poured over the cut-outs. A 70-ft. long template served to align the pile for driving. (A similar one was also used in the construction of the bulkheads.) It also supported the precast slabs until the reinforcing steel in the cut-outs had been welded. About 100 linear ft. of pier were put up each working day.

The template used in the construction of the catwalks measured 45 ft. in length, and was adaptable to both 30- and 40-ft. docks. In one day, as many as six of the 30-ft. docks were completed with one derrick barge and crew. All joints were welded the day they were set and poured the same day or, at the latest, on the following day. Use of Lehigh hi-early cement permitted removal and resetting of the template on the third day after pouring.

Universal Construction Company was general contractor for the Bahia-Mar job; J. H. Philpott and F. V. Ackerman of Fort Lauderdale were the engineers; and Greenkemeyer & Sullivan Associates of Cincinnati, O., were the architects.



• An air view of the transformed yacht basin at Bahia-Mar, Fort Lauderdale, Fla.

• Scene at the Powell Brothers yard during the casting of slabs.

• Loading 10- by 10-ft. dock slabs on a barge bound for Bahia-Mar.

Fleming Manufacturing Co. Forms Bin-Batcher Division —J. F. Van Way in Charge

J. F. Van Way

The Fleming Manufacturing Company, St. Louis, Mo., announces the opening of a new division, to be known as the Bin and Batcher Division, specializing in all types of materials-handling equipment for the concrete products and ready-mixed concrete industries. This equipment will feature a variety of types of bins and batching plants, bulk cement plants, bucket elevators, belt conveyors, etc.

In charge of the new division is John F. Van Way, who was formerly associated with the C. S. Johnson Company. Previous to this he was connected with the Erie Steel Construction Company. During World War II he was concrete plants superintendent in the erection of the Dodge-Chicago plant. Since that time he has designed and supervised the building of many different sizes and types of materials-handling plants in the Middle West.

Buehner Cinder Block Co. Awarded Home Show Prize

At Salt Lake City the Buehner Cinder Block Company was recently awarded the grand prize for its display at the Utah Home Show.

The winning display included two rooms showing various methods of utilizing the firm's products in the construction and decoration of a home. More than 10,000 persons viewed the 250 exhibits and displays.

New H. C. Hays R.M.C. Plant Operating on Full-Scale Basis

Full-scale operation is reported by the new H. C. Hays Ready-Mix Concrete Company of Virden, Ill. The plant consists of a 1½-carload capacity bulk cement bin; a 20- by 60-ft. dugout with reinforced concrete floor, walls and roof; sand and gravel bins, and a crane for unloading freight cars. First commissions of the firm were two grain elevators.

The present owner acquired the business from the late M. C. Robinson in 1944. In addition to the production of the ready-mix he has also operated a concrete block plant.

Lightweight Concrete Used In N. Y. Post Office Roof Job

For the first time in New York a lightweight insulated concrete material is being used on a large scale. Poretherm, an insulated cellular concrete product of the Porete Manufacturing Company, will be used for the roof deck of 27,000 sq. ft. of the new post office building in Woodside, Queens. The Board of Standards and Appeals approved building code amendments some time ago to permit the use of materials of this type.

Porete employs air-entrained portland cement. Only a small amount of water is used for the mixture, which dries rapidly and weighs only about 30 pounds to the cubic foot. Standard concrete may weigh as much as 150 pounds to the cubic foot.

Announcement of the pouring job was made by Thomas J. McDonald of the Porete Company.

California C. M. Association Developing at Record Pace

A remarkable record of association growth was revealed by Clif Hendrickson, secretary-manager of the Concrete Masonry Manufacturers' Association of California at the monthly dinner meeting, held on June 13 in the Rodger Young Auditorium in Los Angeles.

Formed originally to include only members in the Los Angeles region, the association has become state-wide in scope, with members from as far north as San Francisco and beyond. In 1947, when the broadened promotional program was put into effect, there were fewer than a dozen producer members. Today the membership exceeds 150 and continues to grow. A little over three years ago the association was "in the red" to the tune of $8,324; now its treasury shows a healthy surplus. Average monthly income from dues in 1947 was $227. In 1948 it jumped to $1,143; in 1949 it had risen to $1,268. This year it has hit a new peak of $1,493.

Jack Allen (Hollostone Co., North Hollywood) presided at the June meeting. Talks by a member of the Los Angeles Stock Exchange, who predicted that construction would continue at a high level for at least two more years. Another speaker, an insurance expert explained the various angles of earthquake insurance and the method of setting up rate structure.

The W. R. Bonsal Co., Hamlet, N. C., has appointed Carl H. Wilcox, 1018 N. Watkins St., Memphis, as Tennessee sales representatives for Sakrete.

Mishco Corporation Names Mortarless Tile Company As West Coast Dealer

Mishco Corporation of Miami, Fla., has announced the appointment of the Mortarless Tile Machine Co., Inc., of 2623 Riverside Drive, Los Angeles Calif., as its West Coast dealer.

James W. Briscoe is president and Eugene M. Rembac is sales manager of Mortarless Tile.

The West Coast states and Utah, Arizona, Idaho, Nevada, and Montana will be served by Mortarless Tile, which will also act as export distributor for the Pacific Coast. Mishco Corporation manufactures Appley-Yellen Hi-Speed block machines, concrete mixers, skip hoists, and other allied equipment for the concrete products industry.

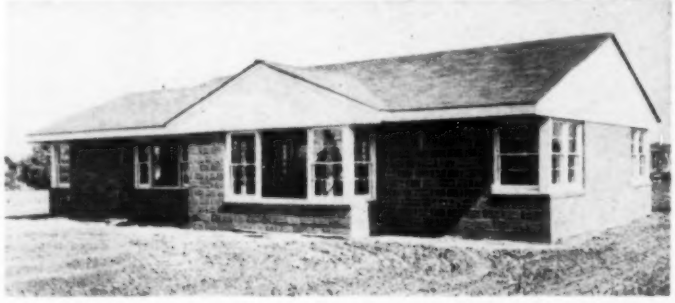
James W. Briscoe

Eugene M. Rembac

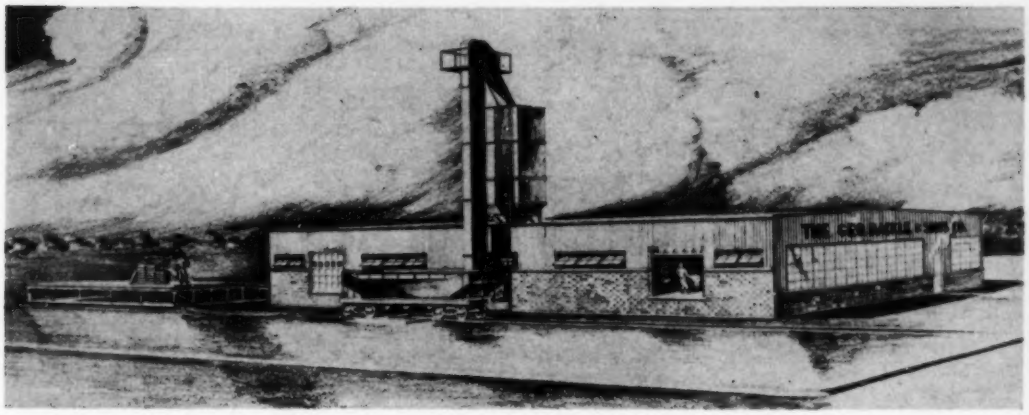
Pour 4,386 Yds. of Concrete In a Day at Hungry Horse

Proceeding at a record pace, concrete pouring at Hungry Horse Dam in Northwestern Montana recently reached a new high when 4,386 cu. yds. went into place in the big structure in 24 hours.

General-Shea-Morrison, prime contractor for the multiple-purpose dam and power plant, is progressively increasing its pours, aiming at a goal of 5,000 cu. yds. daily, or 150,000 cu. yds. per month. Approximately 170,000 cu. yds. of concrete had been poured when the 4,386 point was reached; but it is estimated that more than 1,000,000 more cu. yds. must be placed this year, if construction schedules are to be met.



• The ranch-type home shown above was built with 8- by 8- by 16-in. units in which the Ashlar design face is achieved by means of special dies adaptable to conventional block machines. The units, called Art-Crete, are produced in various shades of buff and brown to achieve a close resemblance to cut-stone construction. The special dies were developed by Artcraft Blocks, Inc., of Canton, O.



• Architectural drawing of The George Rackle & Sons Company's new plant at Houston, Tex.

Rackle's Plant at Houston Makes 100 Squares of Lightweight Slabs per Day

another ON THE SPOT report

THE George Rackle & Sons Company, pioneer manufacturer of lightweight concrete roofs and cast stone, has opened a branch plant in Houston, Tex., to make concrete slab roofing available in that area at favorable costs. Built at a cost of over $100,000, the 125- by 82-ft. single-story plant produces lightweight channel slabs and flat slabs at the rate of about 100 squares per day.

The material used in Rackle's Houston operations is called Featherlite, produced by the Featherlite Corporation at Strawn, Tex., near Fort Worth. It is an expanded shale material produced by bloating the Strawn shale at very high temperatures in rotary kilns. Its use reduces the weight of the slabs 35 to 40 percent below comparable units made with straight sand-and-gravel concrete.

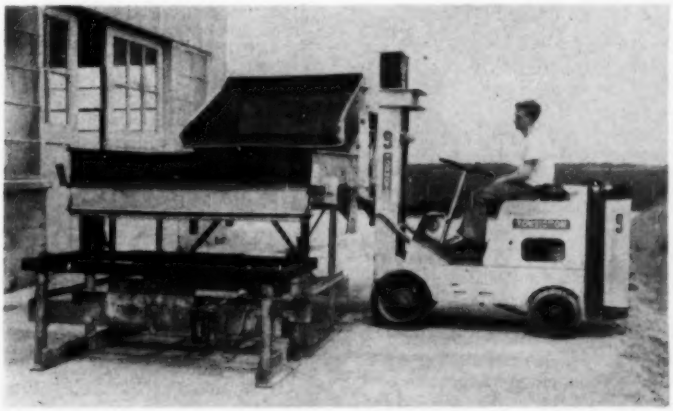
By WILLIAM M. AVERY

The plant has a two-compartment 70-cu. yd. bin for the storage of Featherlite and a sand-and-gravel mixture used when additional strength is required. These materials come to the plant in hopper-bottom cars and are discharged into an under-track hopper, from which a single bucket elevator feeds the bins.

The materials are batched by volume into a one-cu. yd. Besser batch mixer. Cement is handled in bags, and there is an automatic dispenser that releases 15 cu. cen. of Horn Ayr Trap per bag of cement in every batch. The mixer is discharged into a portable hopper which is transported to the various points of use within the plant by means of a Towmotor lift-truck.

Each of the four vibrating tables on which the actual forming is done is equipped with its own supply hopper. The concrete slides from the

• Joseph W. Young, superintendent of the new plant, inspecting some of the company's slabs shipped from Cleveland for use in the Houston plant.



• The vibrating tables on which the slabs are molded are charged with a portable hopper from a central mixer.

• This view, taken during construction, shows some of the steel molds in which the slabs are made. Note the use of the lift truck fork as a working platform.

• This table for flattening and shearing wire mesh was developed and built by Rackle's own engineers.

hoppers to the mold boxes over inclined pans which have air vibrators attached to the under sides. The table frames themselves are mounted on steel springs, and are vibrated by means of off-center cams which rotate at 3,400 r.p.m.

The slabs and molds are picked up from the vibrating tables by means of lifting beams and one-ton Yale hoists which are suspended from overhead rails in each of the five bays of the building. After the concrete has set sufficiently, the forms are rolled over on horses, and wedge keys are knocked out, causing them to spring open far enough to permit stripping. The slabs are then transferred to the storage yard, where they are air-cured for 28 days before they are shipped. There is a car-loading dock adjacent to the plant rail siding, and a truck loading dock which is long enough to accommodate five trailers. The plant is served by the Missouri Pacific Railroad.

Channel slabs are made in depths of 1⅝ and 2 in. All the units are 24 in. wide. Spans on the channel slabs run up to 10 ft. in the 3¾-in. depth., and 7 ft. in the 2¾-in. depth. The maximum length for flat slabs is 6 ft. The flanges of the channel-shaped units are reinforced with ½-in. diameter steel rods, and the webs are reinforced with 3- by 4-in. 10-gauge wire mesh. Depending on the specifications to be met, the weight of the slabs varies from 10 to 16 lbs. per sq. ft.

The new Rackle plant occupies an excellent 8-acre industrial site on the edge of Houston. The lower walls of the building are constructed of lightweight concrete masonry units, and the roof deck consists of lightweight Rackle slabs which were produced in the company's Cleveland plant. The upper walls of the building are covered with corrugated Transite, and the floors are of haydite concrete.

The Houston plant is managed by George P. Rackle, executive vice-president of the company, a grandson of the founder. Joseph W. Young is plant superintendent. The firm was established in Cleveland in 1870, engaging initially in the production of cast stone. The production of roof and floor slabs was begun in Cleveland in 1925. Houston was selected as the location of the first branch plant because it was felt that the company's products offer particular advantages to builders in that area.

Lefler Concrete Block Co. Adds Septic Tanks to Line

Something new has been added to the products of the Lefler Concrete Block Company of Charlotte, N. C., according to word from George F. Lefler, owner. After months of preparation the firm has begun turning out concrete septic tanks approved by city, county, and state inspectors.

The 1,000-gallon tanks are designed to effect economy in installation, which is accomplished by means of the Lefler crew and a truck with a special hoist. The firm has long been manufacturing the concrete tile used in such installations. A fleet of seven trucks makes deliveries of the company's products.

Wilkie Joins Sales Staff Of Sika Chemical Corp.

Charles Wilkie

Charles Wilkie has joined the sales engineering staff of Sika Chemical Corporation, with headquarters in Passaic, N. J. Mr. Wilkie will be made available to serve important engineering and construction projects throughout the United States. For the past several years he has been associated with the H. K. Ferguson Company, Inc., as project engineer in their Atomic Energy Division. Previous activities include private practice as a consulting engineer, as well as employment in responsible positions by some of the leading engineers and constructors in various parts of the United States.

Mr. Wilkie is a member of the American Society of Civil Engineers, and the Structural Engineers Association of Northern California, and is a licensed professional engineer in California, Texas, and Nevada.

Sika Chemical Corporation manufacturers Plastiment and Sika compounds for concrete and masonry.

Contractors' Ready Mix, Inc., which opened a small ready-mixed concreter plant in Whittier, Calif., about four years ago, is broadening its operations. A second plant went into operation near the Santa Fe Springs oil fields, west of Whittier, on March 1. James M. Brown is president of the company.

Bedford Hills Concrete Products, New York, N. Y., was among the accident-free contestants in the safety contest conducted by the Greater New York Safety Council, and received an award at the Council's 20th annual convention and exposition on March 29.

Ohio Ready Mixed Association Convenes at Cleveland

By CHARLES H. BUSSMANN

another ON THE SPOT report

AN almost 100 percent producer attendance, aggregating from 70 to 75 members, gathered on June 15 in the ballroom of the Hotel Cleveland, Cleveland, O., for the annual meeting of the Ohio Ready Mixed Concrete Association. President M. Paul Hunt presided at the one-day meeting.

In his opening remarks Mr. Hunt discussed the Ohio state sales tax. He informed the group that the case to exempt all trucks, parts, etc., is before the Ohio Supreme Court. Mixers are exempt, but a tax is imposed on truck chassis and parts. He explained the cost involved in carrying the case to the Supreme Court, stating that an assessment of from about $4 per unit up to a maximum of $15 per unit would be required to defray expenses. More than half of the membership has already responded, so that approximately $1,400 has thus far been received. With these funds available, the association would not be on the credit side of the ledger, should the fight be lost. The brief was filed on April 11 of this year, and as yet there is no indication when a decision will be reached. However, the feeling is current that it will be handed down by the end of 1950.

Included also in Mr. Hunt's remarks were comments on the truck drivers manual for Ohio producers, which the directors hope to establish. He told members that the National Ready Mixed Concrete Association is also working on the same idea of a manual on a nation-wide basis. In view of this, work done by the directors of the Ohio association has been turned over to the N.R.M.C.A. committee engaged in this subject. The purpose of this manual, which has been a subject of discussion at ready-mix meetings throughout the country, is to educate drivers in correct procedures in the delivery of concrete, safety, customer relationships, etc.

In conclusion, Mr. Hunt indicated that the state of California had made substantial contributions to the N.R.M.C.A. fund to be used in the erection of a research laboratory. A suggestion was offered to the effect that Ohio association members be assessed $5 per unit as a contribution to this cause. The assessment would cover dues for one year in the national association for present members of the Ohio group who are not affiliated with the national group.

The reports of the treasurer and of the auditing committee were read by George Bukey, Arrow Sand and Gravel Co., Columbus, and Bill Kearn, respectively. The former substituted for Treasurer Steve Stepanian, who was not in attendance.

In presenting the report of the secretary, Claude Clarke urged his listeners to take active interest in public bond issues and stressed the importance of a greater vote in such measures. He spoke of the Ohio school construction program and the $71,000,000 state highway construction program, adding that gas tax and auto license revenues showed a 5 percent increase over last year, but that additional revenue is being requested by the state. Expressing hope that industrial insurance rates would be lowered, he cited as exemplary the safety record of the W. E. Anderson Haulage Co., Columbus, which last year was first in Ohio and eighth in the United States. Included in his comments was a reference to the 1,000-lb. increase in axle weight.

The report of the secretary was followed by a panel discussion on *Lightweight Aggregates for Ready Mixed Concrete*.. R. P. Mumford, Beckley and Myers Co., Springfield, was moderator. Various lightweight aggregates were discussed in turn by individual panel members—R. Neil Christy (Marietta Concrete Corp., Marietta), aglite; Dr. R. F. Rea, (Zonolite Co.), vermiculite; Wharton Clay (secretary, Perlite Institute, New York), perlite; and Walter R. Schaefer (George Rackle and Sons, Cleveland), haydite. Each restricted his commentary to approximately 10 minutes, thus providing time for a concluding question-and-answer period. In answer to an inquiry on handling lightweight aggregates, it was brought out that haydite and aglite are adapted to gravity feed, while vermiculite and perlite are bagging operations. On the question of fair yield, slump and mining were established as the primary factors.

At the conclusion of the luncheon, Vincent P. Ahearn, executive secretary, National Ready Mixed Concrete Association, presented a talk on developments in the Nation's capital, touching on the association's work, as well as on affairs of state. The former included discussion of the driver's manual, which the association has almost completed. He spoke highly of Senator Taft, stating that most people in Washington regard him as the ablest man in public life today. Urging Mr. Taft's reelection, he reminded the group that largely due to the senator's efforts the threat of boycott has been removed and that through the Taft-Hartley act he substantially benefitted the industry. He also spoke on the Hoover Commission and the budgetary deficit, appending these remarks with the fact that the Delivered Price Bill has been passed and is before the President. (It has since been vetoed—Editor) Commenting on Senator McCarthy, he said that the feeling is that he is making considerable headway and has convinced many people that domestic communism is still a serious threat. On the subject of war with Russia, Mr. Ahearn stated that no one knows the direction in which events will turn, but that in his opinion war is not foreseeable. In a question - and - answer period which followed, wage and hours laws were discussed and defined.

President Hunt then called Mr. Mumford, chairman of the nominating committee to the floor, and the following officers and directors were elected: president, C. A. Persons, Elyria, O.; vice - president, Herb Rusk; treasurer, Steve Stepanian; directors, Lou Kemter (Cleveland), Carl F. Shoaff (Akron), J. A. Radebaugh (Lancaster), and Charles Kulkman, Toledo.

Independent Concrete Pipe To Open Evansville Plant

Howard Schurmann, president of the Independent Concrete Pipe Corporation of Indinanapolis, Ind., has announced that his firm will open a branch plant at Evansville, Ind., in the near future.

The Indianapolis pipe concern now has plants in Chicago, St. Louis, Indianapolis, and Mishawaka, Ind. During World War II the company operated a temporary plant near Evansville.

From 200 to 6000 Blocks per Day

• A view of the E. De Vries and Sons plant at Grand Rapids, Mich., showing a portion of the property which fans out behind the company office. The plant is partially concealed by the blocks stockpiled for delivery.

By HAROLD R. DRIMILLA

another ON THE SPOT report

BACKED by a success pattern of 32 years of steady growth, the E. De Vries and Sons concrete masonry units plant has earned recognition as one of the most respected business enterprises in and around Grand Rapids and western Michigan. Spreading out over an 8½-acre tract of land, which fans out from behind the neat, eye-appealing company office and pleasingly landscaped surroundings, this considerable operation by no means blights, but rather blends in with the well-kept homey dwellings typical of the residential community adjacent to 1400 Walker St., N.W. Viewed from the street, it is hard to believe that facilities which produced close to 1,000,000 blocks during 1949 are functioning within. This notion is partially offset by a steady parade of trucks to and from the grounds and completely dispelled by an inspection of the plant itself.

Cinder is used in about 75 percent of the block produced, the remainder utilizing sand and gravel taken from the company's nearby 35-acre pit. Recovery is accomplished with two ¾-cu. yd. capacity clamshell-equipped Lorain crawler cranes. The pit also serves as storage and seasoning grounds for the cinder, brought in from industrial plants in and around Grand Rapids and stockpiled to the extent of a year's supply. It remains in stockpile for a period long enough to allow the rain to wash out sulphur and other impurities. When used, it is crushed and screened to ⅜-in. control size, the crushing being accomplished with a Diamond jaw crusher and roll crusher, and run over a Dings magnetic separator pulley as it is conveyed to the plant bin. Cement is hauled in from Bay City, Mich., in bulk and is stored in a 250-bbl. capacity Butler bin.

Mixing is accomplished with a Stearns 42-cu. ft. unit, chute-fed from the bins and located on a balcony arrangement above the block machine. At present a single Stearns 15 automatic block machine is carrying the full production load of from 5,000 to 6,000 8-in. blocks per 8-hour day. The machine is also producing halves, which were formerly cut on a Clipper masonry saw. Cutting of odd sizes continues to be done with the masonry saw.

The Stearns 15 requires but one operator, being completely automatic and eliminating manual handling, cleaning, and oiling of the

• Edward and Mrs. De Vries, who founded the firm 32 years ago; Nicholas De Vries, one of the four sons in the partnership, who acts as general manager; and C. F. Rowell, Stearns Mfg. Co.

• The cement silo, aggregate storage, and accompanying conveying equipment. A portion of the cinder crushing equipment is seen in the shelter at the left.

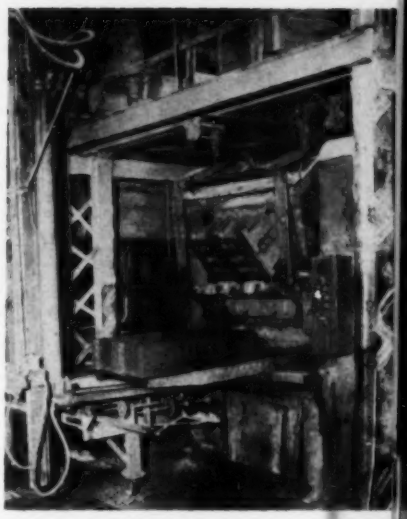
Founded 32 years ago De Vries and Sons of Grand Rapids rank as one of the outstanding block producers in western Michigan

pallets. It was installed in September of 1949, and since that time it has superseded two two-man-operated Stearns No. 9 Joltcretes, both of which have been sold. These latter block machines were brought into the plant in 1946 and 1948 respectively. In their turn they replaced a Stearns Model A Clipper and other units, and at that time quadrupled the productive capacity of the plant, in addition to improving the quality of the block. The present year's supply of 16- by 16- by 6-in. chimney blocks which the firm has on hand were made on the Joltcretes. About 60,000 of these units were produced during 1949.

Plans are now under way for the installation in the near future of a second Stearns 15 machine. This will be used for fractionals, with the present machine continuing on 8-in. blocks exclusively. The preference for this arrangement stems from experience based on similar practice with the two Joltcretes, which resulted in effecting a saving of about 1½ cents per unit on changeovers. Plans for the near future call for the production of 2- through 12-in. block.

Freshly made blocks from the Stearns 15 are racked and transported on a Knickerbocker platform truck to the curing kilns, which line the opposite wall of the building. There are six kilns in all, extending the entire length of the wall, with a capacity of approximately 6,000 units. Green block are cured in the kilns for 24 hours, after which they are transported into the yard on the Knickerbocker platform truck, which then returns the racks to the block machine for re-loading.

Cubing is accomplished with the aid of two Erickson fork lifts, which also load trucks for delivery. Large orders are hauled on tractor-towed flat-bed trailers, two of which are kept in constant operation, with a third standing by in reserve. The tractors consist of a Ford, an International, and



• Using this block machine only, the company is at present producing from 5,000 to 6,000 blocks per day.

• Right: The lintelator, with which precast lintels are produced on order.

• Below, left: The front-end loader used to assist in loading and for clean-up purposes wherever needed.

• Below, right: Loading block for delivery on one of the company's flat-bed trailers. Lighter loads are hauled in ¾-ton trucks.

• A view of the pit which supplies sand and gravel and serves as storage ground for cinders. One of the company's four crawler cranes is seen in the foreground. A fifth crane, truck-mounted, is being used in installing a new truck-loading bin, which will replace the present structure.

a Federal; the flatbeds were manufactured by La Crosse, Trailmobile, and Lawrence. Lighter loads are hauled in 3/4-ton Diamond T trucks. Delivery of finished block is normally effected within a radius of 75 miles, although on occasions hauls as far north as 125 miles to Traverse City have been made.

In addition to its line of regular and chimney block, the De Vries plant also produces concrete brick, precast lintels, and ready-mixed concrete, the latter for small jobs only. Brick is produced at the rate of 12,000 units per day, utilizing a Jackson and Church brick machine. Precast lintels are made to order on a Kent Lintelator machine.

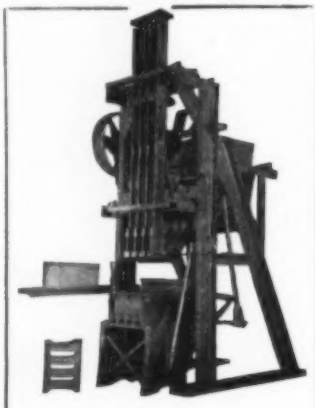
Other construction materials supplied consist of cement paint, mortar sand, gravel, fill sand, reinforcing and steel sashing. Services include bulldozing, excavating and crane service. In addition to the two Lorain crawler cranes at the pit, the firm operates three other cranes of the same make, two crawler-mounted and one 20-ton capacity truck-mounted. The former are used for excavation work and the latter for lifting and moving heavy equipment around the plant, in addition to outside jobs. A Minneapolis-Moline Lull front-end loader is used to assist in loading and for clean up purposes wherever needed.

A fleet of trucks, 16 in number, is required to carry out these combined operations. The fleet includes the previously mentioned delivery units, plus 5- and 6-cu. yd. Ford, Federal and International dump-body types for materials hauling purposes.

The promotional policy of the company favors alert and systematic advertising in the Grand Rapids newspapers. Ads carry such punch lines as these: *First and Largest Manufacturer of Cinder Blocks in Western Michigan Since 1929* and *32 Years of Service.*

De Vries and Sons take considerable pride in the accomplishments of the firm since the time of its founding. At that time the father, Edward, and his wife, made their start with two teams for hauling cement and gravel and a hand-operated block machine turning out 200 units per day. Today the operations require an average employment of from 30 to 35 persons. The elder De Vries has formed a partnership with his four sons, Nicholas, Reinder, Bert and Richard, all of whom have been actively participating since their return from the armed services during World War II. Nicholas De Vries acts in the capacity of general manager and Richard as plant superintendent.

• Removing the blocks, which have been cured 24 hours, from one of the six curing kilns. The platform truck transports the rack into the yard, where the blocks are removed and cubed, then returns the rack to the block machine.



An All-Purpose Machine

The Junior Stripper will turn out more blocks per man than any other hand-operated machine on the market . . . 200 per hour being easily maintained! Nor has quality of output been sacrificed for the sake of speed. Units are uniformly dense, true to shape, of uniform texture.

Stearns Clipper Stripper Machines; Stearns Joltcrete Machines; Stearns Mixers; Cast iron and press steel pallets. Straublox oscillating attachments, etc. Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager — Columbus, Ohio

Safety Certificate Awarded Universal Concrete Pipe Plant

Universal Concrete Pipe Company's Dothan, Ala., plant has been awarded a safety certificate by the American Mutual Liability Insurance Company. During the last four years the plant has had only one minor lost-time accident.

Plant Manager John Harris and Superintendent Pete Arnett hold regular safety meetings with all personnel. Their record proves that safety can be a reality in the concrete manufacturing industry.

Frank C. Webb, founder of the Red-D-Mix Concrete Company and owner of the Webb-Boone Paving Co. and the Tower Grove Quarry, St. Louis, Mo., died on April 3 of a heart ailment at his home in Clayton, Mo. He was 83 years of age and had retired from active business life in 1943.

Versatile California Firm Specializes in Specialties

By HARRY F. UTLEY

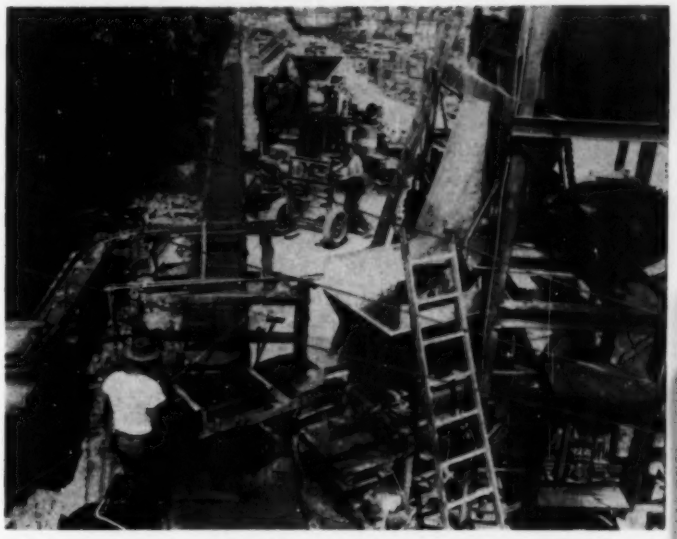
another ON THE SPOT report

ONE of the most successful and most unusual concrete products businesses in southern California is one which is operated by Bernard Flam of Concrete Industries, Inc., at Van Nuys.

In operation now for nearly a year, the plant is extremely busy, yet produces none of the usual masonry units, preferring to concentrate on a variety of high-profit machine-made specialties such as stepping stones, lawn curbing, capping blocks, foot scrapers, etc. Production is shortly expected to start on concrete roofing tile, while other items still in the planning stage are incinerators, decorative louvres, benches and sun-dials.

The heart of the plant is the "Concrete Press," designed and built by Mr. Flam. This versatile machine is capable of making a unit of any shape which lends itself to vertical stripping. The operation of the machine requires an operator to insert the plain pallet, hoe in the concrete, and strike off the excess. Pressing and stripping of the units is accomplished automatically by manipulating the control valves. The machine is producing an average of 1,200 pallet-loads per day. Finished units are stacked, one pallet-load above another, five to seven high. A lift cart is used to transport the stack of freshly-made units to the curing area and to return empty pallets to the machine.

• The operator removes a pallet-load of scalloped lawn-edging units from the hydraulic-powered machine.



• Curb units at the Concrete Industries plant at Van Nuys, Calif., are produced on the machine at the lower left. Note the roller conveyor which extends around the entire yard. "Kickers" keep the loaded pallets moving.

Units made on the Concrete Press are so precise that two stepping stones, for example, held together admit no light when held up to the sun. This extreme precision allows them to be laid up as a patio floor into any pattern desired, using a combination of shapes and colors. Oxides used in the mixture impart integral color, and the surface texture is typical of uniformly pressed concrete. This texture, incidentally, has been one of the main selling points. Old-fashioned hand-made and hand-troweled stepping stones, long marketed in the southern California region, were smooth *and slippery* when wet. The machine-made stones are nonskid when wet and provide a safe walking surface at all times. Top edges are marked off and rounded so that the finished appearance when laid up is attractive to the eye. Capping blocks for masonry garden walls are also made on the Concrete Press in the same manner as stepping stones. They are modular in length but somewhat wider than the wall thickness, giving them a pleasing and protective overhang.

The newest product is an X-shaped unit for use in constructing concrete-masonry garden walls. Inserted into the wall at intervals, it creates a decorative effect and admits light and air, complying with building requirements in some areas which insist that walls have openings for ventilation along property lines. Modular in outside dimensions, the unit costs less than the blocks it replaces when laid up.

Another operation at the Flam plant produces Scallop-Curb and Curb-Block, both lawn edgings. These units are produced on a modified Flam No. 3 block machine. Ejected from the machine on plain pallets, they are placed on a roller conveyor and moved on into the curing yard by hydraulic powered "kickers." Lawn-curbing units have a lip in front of the raised scallops or face to keep the grass from growing closer to the edge than a lawn-mower will cut. (See illustration) Curved sections make excellent tree rings or circular flowerbed curbings.

Sales are made at the wholesale level, for the most part, to nurseries, building-supply dealers, concrete-block plants, and other outlets which stock material for the building and landscaping trades.

The main business of Concrete Industries, Inc., continues, however,

AIR VIBRATORS

Type "F"

LOW COST AIR VIBRATORS GUARANTEE STEADY MATERIAL FLOW OR SETTLE CONCRETE MIXES

Powerful hammer-like blows delivered by CLEVELAND Type "F" air vibrators prevent arching-over and plugging in bins, hoppers and chutes. These dependable units have been designed for use on all types of hoppers and bins handling sand, cement, cinders and all other granular materials.

Type "LSRR"

LSRR air vibrators utilize cast steel male wedge type mounting bracket which fits the female bracket that is standard equipment on most covered hopper railroad cars. In addition, female brackets can be furnished for attachment to bins, concrete forms, chutes, etc., and a single LSRR vibrator can be moved from one installation to another to handle several different applications.

Type "VG"

New vibrators featuring a portability and rapid, easy attachment to wooden studs or metal structural members are now available. These units are recommended for use on concrete forms, hoppers, bins, dump trucks, etc. to settle or shake-out their contents.

Type "UH"

These CLEVELAND air vibrators and many others are illustrated and described in the new CLEVELAND VIBRATOR catalog. Write today for your copy.

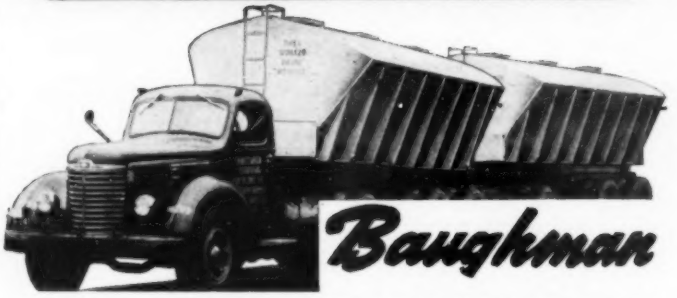
THE CLEVELAND VIBRATOR CO.
2711 CLINTON AVENUE
CLEVELAND 13, OHIO

• Bernard Flam poses beside an exhibit of the plant's products. These include stepping stones, lawn curb and edging, tree rings (foreground), wall-capping blocks, and the X-shaped filler blocks for ventilating masonry garden walls.

to be the design and building of concrete machinery. The firm has a large, well-equipped factory in Van Nuys for turning out such equipment. Through the plant described and its numerous sales outlets it is able thoroughly to test production and ultimate market demand for any of the concrete specialties it designs.

Mr. Flam reports such a demand for the Concrete Press that he is preparing to launch a program to manufacture and market the machine throughout the country. Many of the inquiries are coming from established concrete block producers who will complement their regular line with the production of the specialties here described.

Greater Payload... Lower Equipment Cost



Baughman

BULK CEMENT TRANSPORT

Meets your capacity and load requirements without the cost of special equipment. STANDARD sizes . . . 15 to 33 feet long. Ruggedly built of high tensile alloy steel for more strength with dead weight cut to the minimum. Can be made self-supporting. Waterproof roof . . . manholes evenly spaced for capacity loading.

Self-Unloading — twin screws give fast action. Special air cells assure easy starting and high speed discharge. Equipped with powerful motor . . . all controls conveniently located on outside of body.

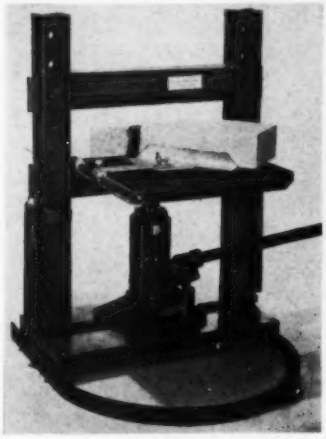
WRITE for Full Details

BAUGHMAN MFG. CO., Inc.
571 SHIPMAN ROAD
JERSEYVILLE, ILLINOIS

NEW MACHINERY and SUPPLIES

● Hand-operated Cutter

The "Red Devil" masonry cutter is a completely portable machine for cutting brick, pumice, concrete block or flagstone. Equipped with a hand-operated, Hein-Werner hydraulic jack, the Red Devil can be used any place on the job. Two hardened-steel blades simultaneously bite into the top and bottom of the masonry material, producing straight cuts

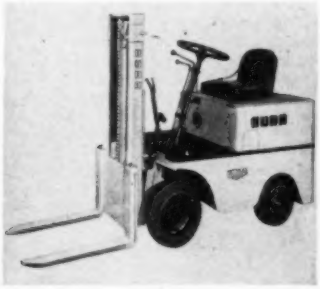


and sharp corners. A mitre tray is included for presetting cuts, accuracy and volume cutting.

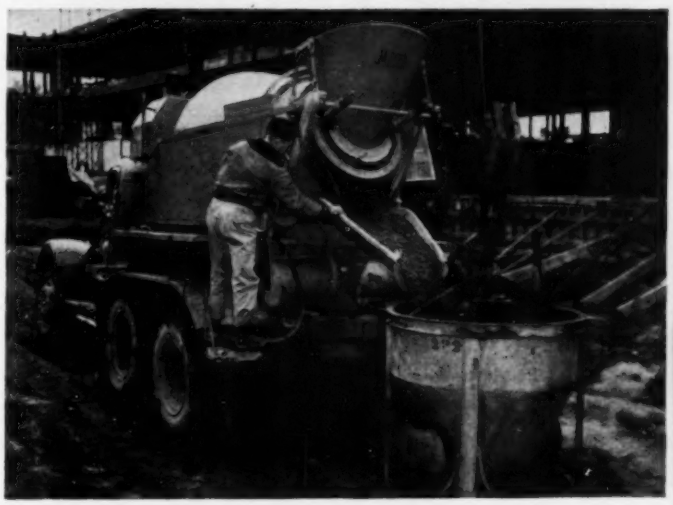
This tray is lined with sponge rubber to prevent ragged breaks. The smallest cutter, model C-110, will handle material up to 10 in. in width and has a cutting pressure of 3 tons; Model C-113 will cut masonry up to 13 in. in width and has a cutting pressure of 5 tons; and, Model C-117 can be used to trim the largest concrete blocks. Lee Sales Company, 10439 San Carlos, South Gate, California.

● New Fork Lift-Truck

The Buda Company's models FA-20-24 and FPA-20-24 fork lift-trucks are rated at a 24-in. load center for greater lifting



It's JAEGER built to give you BIGGER DAILY PAYLOADS



LIGHTER WEIGHT by 600 to 1600 lbs. *but no change in heavy gauge of drums and blades!*

LOWER PRICE *by hundreds of dollars!*

LESS MAINTENANCE *by an average of 50%!*

MORE SPEED *to make more payload trips per day!*

2—3—4½—5½ YD. SIZES
End-Loader or "Sealed Drum" Top Loader Types. Fluid drive (if you want it). Truck engine drive also available.

New 24 rpm drum-charging speed. End-loads dry material at rate of 10 seconds per yard.

New 60 lb. pressure jet. Distributes water at 100 gallons a minute.

Highest speed discharge of wet or dry concrete — 20-25 seconds per yard for 4" slump material, 1" slump in 60 seconds.

An instant-opening, instant-closing, positively self-aligning hopper.

A hopper seal that ends seal troubles. Self-lubricated from 5 lb. reservoir, gives longest leak-proof service, and is easily replaceable in 30 minutes *without removing hopper.*

New "spider" drum drive — a major design improvement.

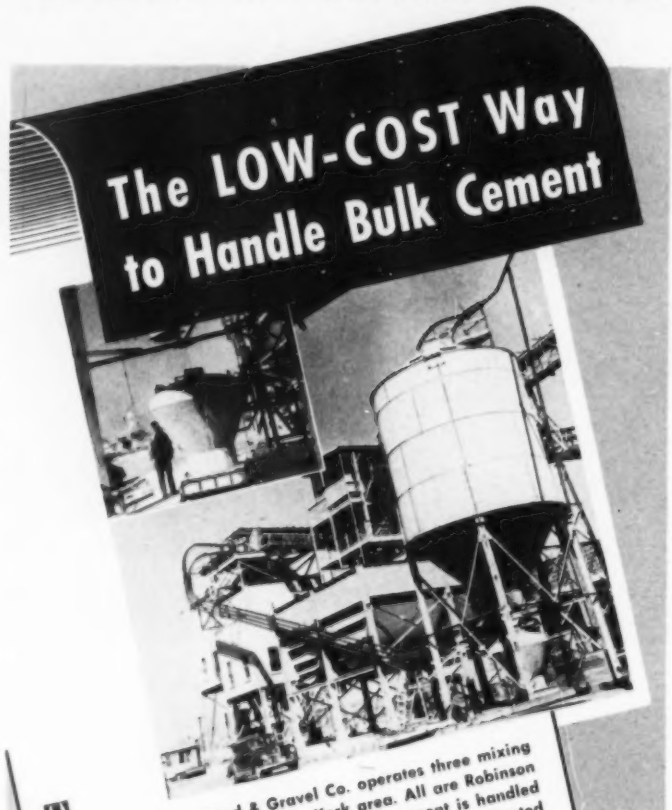
Power and 2-speed transmission in one unit. Permanent gear alignment.

Ask your Jaeger distributor to show you these and many other Jaeger-engineered improvements—or send for complete Catalog TMH-10

THE JAEGER MACHINE COMPANY, Columbus 16, Ohio

AIR COMPRESSORS • PUMPS • MIXERS • HOISTS • TOWERS
AGGREGATE SPREADERS • BITUMINOUS PAVERS • CONCRETE SPREADERS, FINISHERS

ROBINSON *Air-Activated* CONVEYOR



The Metropolitan Sand & Gravel Co. operates three mixing plants in the Metropolitan New York area. All are Robinson equipped. In the plant illustrated above, cement is handled from storage to the mixing plant by a Robinson Air-Activated Conveyor System. This Robinson Activator unit conveys either Portland or quick-setting cement to two batch mixers. Dual conveying pipe lines can be seen running to the top of the mixing plant in the background.

Cost reduction comes about in this way: pneumatic conveying figured out much cheaper than mechanical handling; the Robinson System would provide lowest power and maintenance costs. For the Robinson System uses only air as a source of power. It requires no motor-driven parts to feed the cement into the system. Thus, air requirements are low and maintenance is negligible.

If you have any cement handling operation, here are two ideas for consideration: (1) order your cement in bulk and (2) handle it the Robinson way. We'll be glad to help you in planning for idea No. 2.

ROBINSON *Air-Activated* **CONVEYOR SYSTEMS**

Division of
MORSE BOULGER DESTRUCTOR CO.

Representatives in Principal Cities

211-G East 42nd Street • New York 17, N. Y.

Represented in England by Blaw-Knox, Ltd., London

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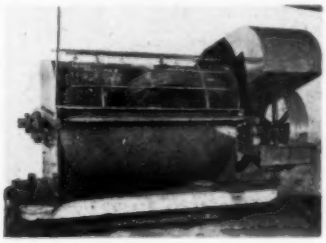
capacities which permit handling loads of 2220 lbs. at 20-in. and 2600 lbs. loads at 15-in. load center. Such design changes as a new steering axle, new-style solid carriage plate, redesigned forged forks, adjustable deluxe cushion operator's seat, larger-diameter steering tires, and interchangeable masts are incorporated in both models.

Although several lifting heights are available, the standard mast of the new 2000-lb. fork lift-truck has a collapsed height of 64½ in. with an 85-in. lift. The two-speed forward and two-speed reverse transmision, single hydraulic tilt-raise-lower control lever, and gear shift levers mounted on the steering column are operator-efficiency features.

● 30-Cu. Ft. Mixer

The Praschak Machine Company of Marshfield, Wis., has developed a new 30-cu. ft. mixer in addition to its regular line of mixers (8-, 16-, and 21-cu. ft. sizes).

This new unit has a 3½-in. cold-rolled steel main shaft, 3½-in. ball bearings, extra durable gears, and a heavily constructed main drum protected by easily replacable liners. The manu-



facturer states that the gears and drive assembly are located on one side and furnished with a protective cover which keeps the mechanism clean and also serves as a safety device. (All models are now being featured with gear and drive assembly on one side, but can be had on either side). The drive of this new unit is equipped with a roller chain.

● Block Fork

The new Schmidgall No. 333 block fork, a three-pronged device, has speeded up block handling for a number of concrete products firms, according to the Schmidgall Manufacturing Company of Peoria, Ill.

Prongs of the No. 333 are spaced to handle two 16 in. stretcher courses. This wider stretcher course facilitates truck unloading, users report, and also provides more stable support for higher yard stacking. It is pointed out that increased clearance for the prongs allows lift truck operators to pick up block cubes faster.

Like other Schmidgall forks, the No. 333 fits any lift truck. Its operation is completely automatic; no pallets are required, and there are no controls between the truck and the fork. The stretcher course is held in place by grippers which are forced against the blocks by the weight of the load. The 16 in. width of stretcher courses may be

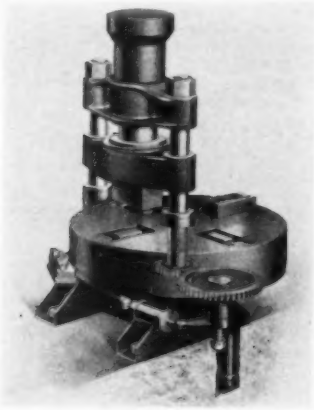
formed by four 4-in. blocks, two 8-in. blocks or one block turned on the 16-in. width.

The No. 333 handles a 48- by 48-in. cube, but the three-prong design is also available in Schmidgall's No. 322 fork, for 48- by 32-in. cubes; and the No. 325 for 48- by 40-in. cubes. Three-prong forks can also be built to handle 18-in. blocks.

● Interlocking Units

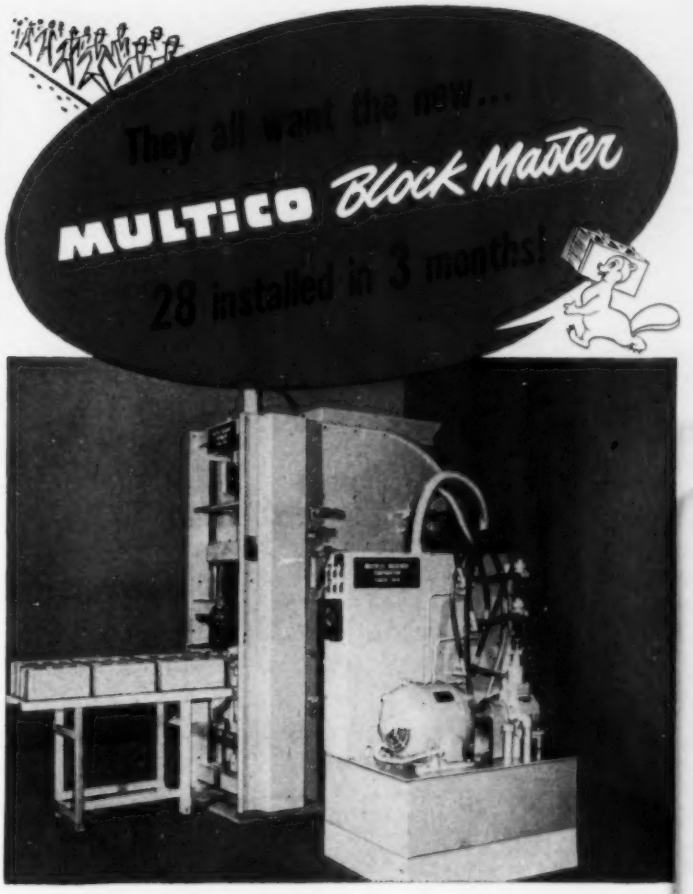
Interlocking mortarless blocks made from waste materials have been developed by Hydro-Forged Stone Associates, Inc., 434 Bulkley Bldg., Cleveland, O., on their specially-designed hydraulic press, built by the Baldwin Locomotive Works of Philadelphia.

The material is fed into a continuous mixer and loader manufactured by the Kent Machine Company, Cuyahoga Falls, O., for Hydro-Forged Stone. The



mix is fed automatically into the press, which turns out formed blocks at the rate of 720 per hour.

The standard block, 8 by 4 by 16 in. in size, is hollow, and is made with a patented tongue-and-groove design for a snug fit when laid up in a wall. To prevent seepage of moisture, a mastic material is applied on the grooves with a gun as the blocks are assembled. Hydro-Forged Associates claim that nearly 75 percent in construction costs can be saved by using these units.



Hydraulically Powered • Fully Automatic
Labor Costs Slashed to Less Than 1c per Block

EXCLUSIVE FEATURES

Separate Power Pak Control Cabinet

Pressure Vibration Plus Tamping

Handles all Aggregates

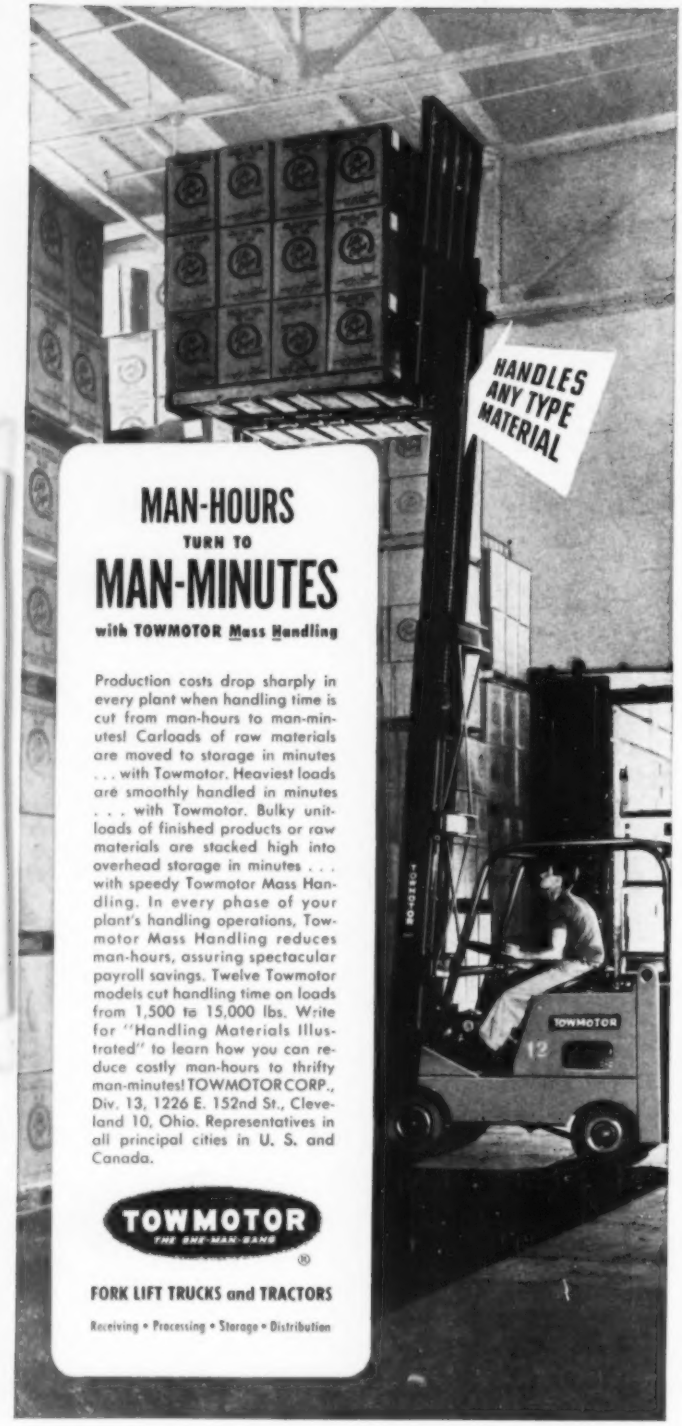
Makes all Sizes and Shapes of Block

Yes, the trend is to Multico—28 new Block Masters have been installed in the past 3 months. 28 more plants can now step up production, fill orders faster and easier with a higher quality block at lower labor costs. The *MULTICO BLOCK MASTER* is completely automatic—just set the controls and *BLOCK MASTER* takes the aggregate, vibrates on pressure, then automatically tamps block to size, all in one operation—an exclusive *MULTICO* feature. The *BLOCK MASTER* is a standard production machine. The separate power pak can serve additional machines—another saving. The *BLOCK MASTER* uses plain steel pallets, enabling you to produce any size or type of block desired. Let a Multico Field Engineer assist you in layout and planning of your plant. This is a free Multico service backed by 45 years of know how and experience. Learn first hand why 28 new Multico equipped plants have been started in just 3 months.

Write for Free Catalog or Location of Nearest Machine in Operation.

MULTIPLEX MACHINERY CORP. ELMORE OHIO

MANUFACTURERS OF BLOCK MACHINES • MIXERS • SKIP HOISTS • STRIPPERS • ELEVATORS



MAN-HOURS
TURN TO
MAN-MINUTES
with TOWMOTOR Mass Handling

Production costs drop sharply in every plant when handling time is cut from man-hours to man-minutes! Carloads of raw materials are moved to storage in minutes . . . with Towmotor. Heaviest loads are smoothly handled in minutes . . . with Towmotor. Bulky unit-loads of finished products or raw materials are stacked high into overhead storage in minutes . . . with speedy Towmotor Mass Handling. In every phase of your plant's handling operations, Towmotor Mass Handling reduces man-hours, assuring spectacular payroll savings. Twelve Towmotor models cut handling time on loads from 1,500 to 15,000 lbs. Write for "Handling Materials Illustrated" to learn how you can reduce costly man-hours to thrifty man-minutes! TOWMOTOR CORP., Div. 13, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all principal cities in U. S. and Canada.

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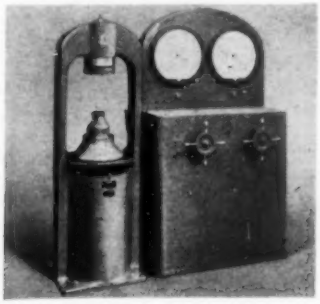
Ask to see the 30-minute Towmotor movie, "THE ONE MAN GANG" in your office. Shows how leading industries cut handling costs.

● Concrete Tester

A new concrete and cement testing machine of 300,000-lb. capacity has been announced by The Baldwin Locomotive Works, Philadelphia 42, Pa. Principal feature of the new machine, as compared with the previous design, is that loading and weighing units are separate. This prevents the transmission of load shocks



to the indicators. The two-unit design also permits varying their relative positions to suit conditions of use and protects the operator from flying or falling particles of breaking specimens.

The device is a hydraulic compression-type machine especially suitable for standard concrete cylindrical test specimens 3 in. by 6 in., 6 in. by 12 in., and 8 in. by 16 in. Special bearing blocks are available for testing building blocks 12 in. wide and 18 in. long. These blocks may also be used for testing cylindrical specimens.

● Prefabricated Barbecue Pit

A new prefabricated stone barbecue pit which the manufacturer claims can be installed on any site in two hours is being introduced by Henkin Industries, 171 Monroe, Memphis, Tenn.

The Henkin "Bar-B-Que" pit is lined with a special protective casting of mica

and cement to prevent fire damage and has a number of other special features, according to Maurice Henkin, head of the developing firm.

Each pit is cast in only 12 basic parts for easy assembly. The synthetic stone used is made from portland cement, crushed quartz, waterproofing, metal reinforcement, and sunfast colors.

Other features include a solid stone

front, enabling the owner to cook while comfortably shielded from the fire; a cooking grate 33 in. high; shielded, insect-proof cooking areas; ample storage space for fuel and utensils; and an aluminum screen in the chimney to catch sparks.

● Concrete Bucket

A new concrete bucket designed for handling low slump concrete containing large aggregates and air-entraining agents has just been announced by Blaw-Knox Company, Pittsburgh, Pa. This new circular Model CAC concrete bucket is designed to load and discharge all concrete rapidly and completely. An air-operated clam gate provides positive con-

trol and quick action in opening and closing. A part of the load can be deposited in one location and the remainder in another if desired.

Rectangular discharge openings prevent arching of concrete over the discharge throat. The transition from the circular hopper to the rectangular discharge throat produces hopper slopes of 70 degrees, with corners which are practically vertical. This new bucket has a larger water-level capacity and is lighter in weight, yet sturdy enough to withstand the abuse encountered on construction work. Model CAC concrete buckets are furnished in 2-, 3-, 4-, and 8-cu. yd. sizes. The 8-cu. yd. model can be supplied as a two-compartment or single-compartment bucket.

Model CAC buckets have been used with highly satisfactory results on big concrete dam construction work. They will discharge freely without vibrating the bucket the types of concrete specified by the U. S. Engineers, Bureau of Reclamation and other engineering agencies for mass concrete construction for dams. The Blaw-Knox Company, Farmers Bank Bldg., Pittsburgh, Pa.

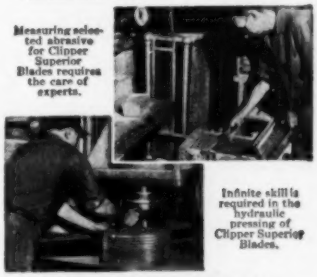
● Throttle Control

Improved economical and efficient operation of dump trucks, tail gate loaders and Stratton "Hydroloaders" is made possible by the Stratton "Hydro-Throttle Control." The unit is installed without special tools on all makes of trucks equipped with hydraulically-operated units deriving their power from a power

Specify GENUINE Clipper SUPERIOR BLADES

Cut Any Masonry Material Easily

Regardless of hardness... there's a GENUINE Clipper Superior Blade to cut any masonry material with perfect smoothness and real economy.



Measuring selected abrasive for Clipper Superior Blades requires the care of experts.

Infinite skill is required in the hydraulic pressing of Clipper Superior Blades.

YOU CAN DEPEND ON CLIPPER SPECIFICATIONS

Every Clipper Blade is the result of constant research and is recommended with expert knowledge of masonry materials. When you have the correct GENUINE Clipper Superior Blade or Clipper Bonded Diamond Blade for WET or DRY cutting you'll find it easy and economical to slice thru the hardest materials.

Attaching blotters to Clipper Superior Blades after individual selection and testing.

Cartons or Cases...Clipper Superior Blades are packaged for convenience and protection.

SOLD ONLY... DIRECT From CLIPPER FACTORY BRANCHES

Because of the tremendous variety of masonry materials the correct Clipper Blade for your...Brick-Tile-Stone or Concrete Product ...can only be recommended by *masonry Specialists!* "SAME DAY" Shipment from 9 Clipper Branches or the EXACT Specification for any material... WRITE TODAY and mention the material!

GENUINE CLIPPER BLADES

...Over 57 Specifications

DRY ABRASIVE 6" to 18" | DIAMOND BLADE 6" to 24" | WET ABRASIVE 14"

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The ORIGINAL Clipper MASONRY SAW

Cuts ALL Masonry Material Faster

YOU CAN MAKE MONEY WITH A CLIPPER

STOP..high masonry cutting costs—START ..getting smooth, simple & economical cutting performance. GO..(at a savings) on any size job with one of 9 CLIPPER MODELS.. each with Original Clipper Features.

9 MODELS Priced from $195

The Right Combination for Advanced Masonry Cutting

DRY ABRASIVE 6" to 18" | DIAMOND BLADE 6" to 24" | WET ABRASIVE 14"

Yes, it's Clipper Masonry Saws, Clipper Superior and Diamond Blades. Whether DUSTLESS (wet) or Dry cutting there's a Clipper guaranteed "To Provide the Fastest Cut..At the lowest Cost..With the Greatest Ease..Any Time..Any Where!"

PATENTED CLIPPER FEATURES

AUTOMATIC BLADE PRESSURE | SELECT A NOTCH | ADJUST A CUT CONTROL | ONE SPOT OPERATION

With a Clipper on the job masonry cutting is easy..just place material on conveyor cart ..Select-A-Notch instantly sets cutting head for material thickness. Then WHIZZ thru cut as the blade Pressure Equalizer takes over.

FREE TRIAL Test & Try a Clipper WITHOUT OBLIGATION On *YOUR* Job—with *YOUR* materials!

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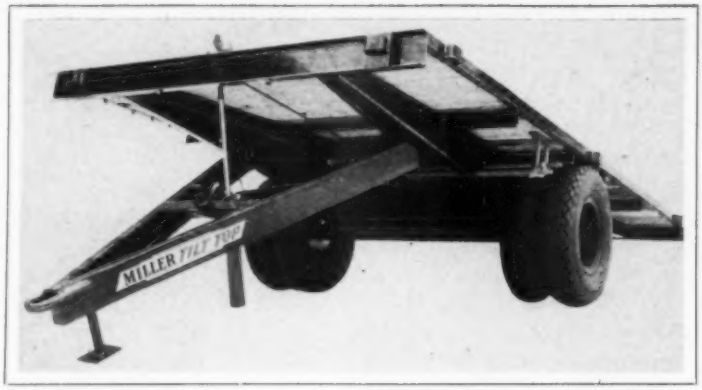
take off source on the transmission or separate power pack. The unit is installed on the engine at any convenient location to permit unobstructed linkage to the accelerator lever on the carburetor. This actuating linkage is a simple non-kink, heavy-duty bead chain. Standard tube fittings and conventional hydraulic lines are employed between the Hydro-Throttle Control and the p.t.o. pump.

The control mechanism is said to be simple and foolproof in operation. Pressure from the p.t.o. pump or equivalent automatically actuates the piston in the Hydro-Throttle control; thus, as pressure from the power source increases to lift a load, the piston is forced into action to speed the engine to the proper r.p.m. As the load is stopped or the pressure is reduced due to varying conditions, the throttle instantly and automatically returns the engine to idling speed. Unnecessary racing of the motor is thus eliminated. The valve is preadjusted at installation, thus making it impossible to overpower or otherwise develop more motor speed than is actually required.

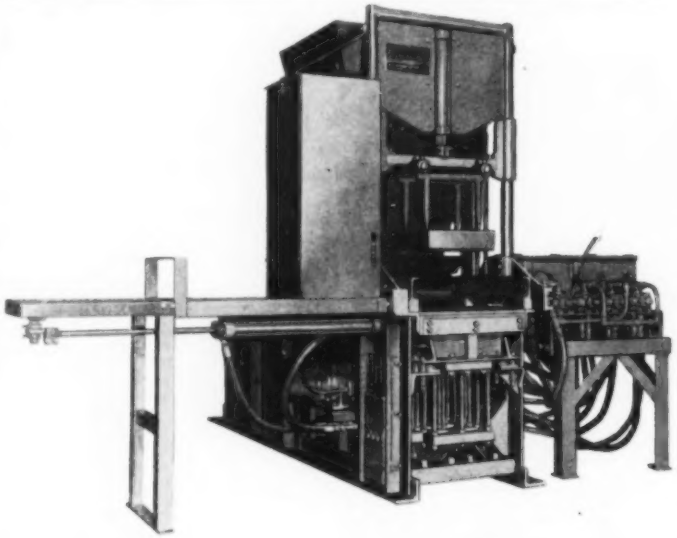
The Stratton Hydro-Throttle Control is A.S.I.E. approved. It is also approved and is being distributed nationally by the Truxtell Corporation. The Hydro-Throttle Control was designed and is manufactured by the Stratton Equipment Company, Hanna Building, Cleveland 5, Ohio.



● Tilt-Top Trailer

A new model of heavy-duty tilt-top trailer is being manufactured by Ray Miller Research Engineers, 727 West Burnham Street, Milwaukee 4, Wis. The frame of the 10-ton Model B is formed of channels 12 in. deep in the center and of ¼-in. steel with five cross-members. Three-in. channels extend from corner to corner in the form of an X. The X-member, which supports the platform, is welded to each cross-member, bracing it for side shock loads.

The tongue, front, and rear cross-members are 6-in. rolled channels. The straight through-type axle consists of heavy tubing with 3⅜-in. diameter solid high-carbon steel stub inserts. A 10-in. channel above the axle connects the two tapered main frame channels, to eliminate side sway in the frame and to give a solid steel support from the platform to the axle. Budd hubs, dual wheels and Goodyear 8.25 x 15, 14-ply tires are standard equipment. The platform is 8 ft. wide by 34 in. high.



● Block Machine

Capable of producing 3,000 masonry units per day, the new George "Series 400" hydraulically operated concrete block machines are bringing enthusiastic response from the field, according to the manufacturer, the F. C. George Machine Company of Orlando, Florida. Up to 10 percent of cement is reported saved.

Producing either "Redi-Furred" or conventional blocks, the machines use "Press-pac" action, plus high-frequency operation, "Rolled-top" or "Press-top", with direct-acting cylinders insuring minimum maintenance cost.

Three models are available: "400 A", which is fully automatic, with air hoist and automatic pallet feed; "400 H", designed for one-man operation, with air hoist optional; and "400 H3", one-man operated, also with air hoist optional, but a stripped model without any automatic features.

● Precast Fireplace

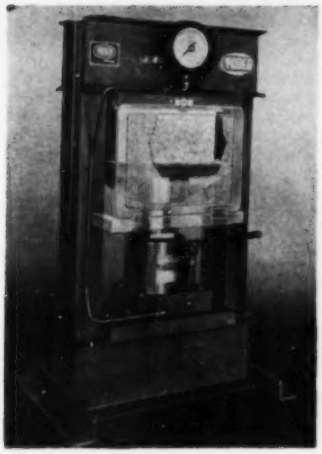
A process for making a precast masonry-type outdoor fireplace has been announced by F. W. Flowers, president of the General Engines Company, Inc., Gloucester, N. J.

Included in the process is a set of precision molds, as well as a special simple technique for fabricating the grills.

As seen in the illustration, the fireplace consists of eight precast sections of concrete made to simulate fieldstone. A standard firebox assembly is used for the grill. With the sides placed directly on a floating concrete base slab (a part of the assembly), there is no need for a prepared foundation. As the fireplace is made sectionally, it is easy to transport and handle. It is claimed that only 20 minutes is required for an installation.

● Compression Tester

A new 100-ton concrete testing machine has been designed especially for use by ready-mixed and concrete products manufacturers in their own plants. By limiting the capacity to 100 tons, it was found possible to lower the cost, thus placing it within easy reach of most plants, large and small. The machine



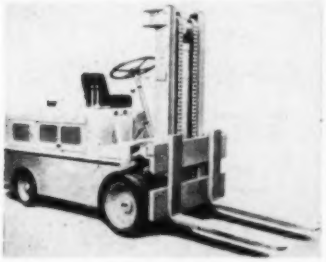
meets all the essential requirements laid down by A.S.T.M. specifications for such machines. It will test 6-in. cylinders, brick, and block up to 8- by 8- by 16 in.

Manufactured by the Yoder Company, 5500 Walworth Ave., Cleveland, O.

● 10,000-lb. Fork Truck

A 10,000-lb. capacity fork-lift truck, gasoline-powered and equipped with the "Dynatork" drive, has been added to its line by the Industrial Truck Division of Clark Equipment Co., Battle Creek, Mich. The new model is known as the "Utilitruc-100".

The Dynatork drive will be standard equipment on the new truck, and the



only type of drive available. It transmits engine power through a magnetic field, across an air gap, eliminating the need for any type of friction clutch. The conventional transmission is also replaced by constant-mesh forward-and-reverse gearing.

Other noteworthy features are the Clark pivoted steering-axle assembly, which increases stability by maintaining all four wheels in constant contact with the road surface; and a 6-cylinder Red Seal Continental industrial-type engine of 209-cu. in. displacement, developing 50 b.hp. at 1800 r.p.m.

Fred Bell recently announced a ready-mix concrete service for the Kosciusko, Miss., area, with a modern plant to mix concrete to specifications.

KENT FEEDERS & ELEVATORS

Incorporating Special Features of ADVANCED DESIGN

Kent Elevators and Feeders are evolved out of years of experience in building material handling machinery.

• • •

KENT also builds CAR UNLOADER

Type FEEDERS for operation under tracks for unloading material from cars. This feeder is built in longer lengths than illustrated at the left.

• • •

AN IDEAL COMBINATION

The KENT No. 410 FEEDER operating in conjunction with the KENT motorized top drive elevator is an ideal combination that will pay for itself quickly and produce dividends for years to come.

No. 410
ADVANCED MODEL FEEDER

For handling sand, crushed stone, aggregate, etc. from hopper or Gondola Car.

It is driven steadily and smoothly by the elevator motor through the elevator belt. Material is continuously fed into boot by long-life rubber belt — pressure, grease lubricated anti-friction bearings — rollers support belt at intervals.

Adjustable hopper gate governs volume of material fed into elevator boot.

No. 139
KENT MOTORIZED ELEVATOR

Constructed entirely of high grade approved materials. All metal except belts.

Unit drive is by electric motor through V-belts. Shafts revolve on anti-friction pillow blocks, pressure grease lubricated.

Elevator is easily attached to bin by means of heavy channels at right angles to main members.

The KENT MACHINE COMPANY
Manufacturers of CONCRETE PRODUCTS MACHINERY *Since 1925*
CUYAHOGA FALLS OHIO, U.S.A.

Send complete information and prices as checked below.

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☐ The Complete KENT LINE

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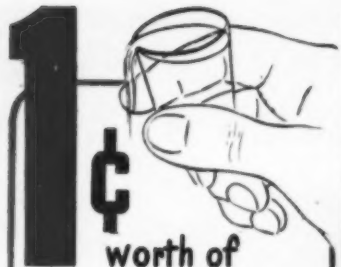

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Gives Concrete Units Greater Cohesion Increased Plasticity, Better Texture.

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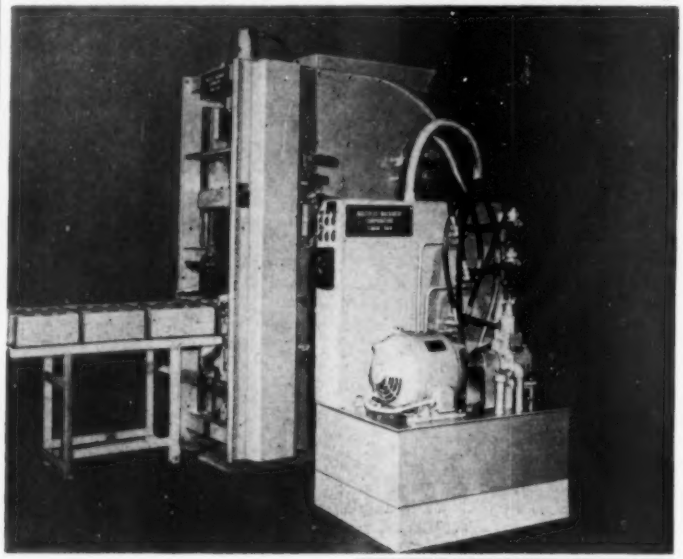
2225 N. Humboldt Ave.
Milwaukee 12, Wisconsin

● Block Maker

The Multiplex Machinery Corporation of Elmore, O., announces its new Multico block machine, The "Block Master", hydraulically powered and fully automatic. The machine accepts any type of aggregate; it tamps under pressure vibration, producing in one operation all sizes and shapes of blocks which are uniform in size, weight and texture with flat smooth surfaces and sharp edges.

The Block Master is designed for quick changeover of different mold boxes to produce any size or type of block desired. Units of special height can be produced by adjusting the sizing columns. Plain steel pallets are easily stacked in the machine by the operator. The device functions automatically, requires no op-

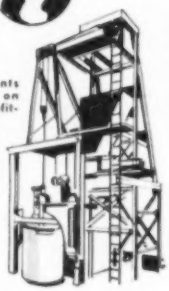


UNIVERSAL

Concrete products and their manufacture are the bread and butter of Universal's men in 19 plants scattered over 10 states. How take pipe-making machines. Dozens of Universal men over a period of years have contributed improvements in design and construction. Advantages resulting from this accumulated experience has made Universal heavy-duty machines efficient profit makers for users everywhere. It's better to own Universal equipment than to compete against it.

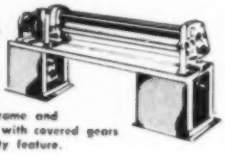
BUY OR LEASE UNIVERSAL PIPE MACHINES

Leasing arrangements can be arranged on terms that assure profitable operation. You needn't invest the entire purchase price to begin operation. Universal Pipe Machines true-tamp at 680 strokes a minute. Make quality, long-lasting pipe. Choose from four sizes: 5"-24", 6"-48", 12"-60", 24"-72". Write for full details.

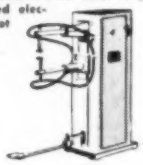


WIRE BENDING ROLLS . . .

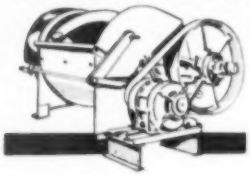
Bends reinforcing wire to any radius, accurately, quickly. Extra heavy frame and oversize bearings, with covered gears and overload safety feature.



WIRE MESH WELDER Specially designed for welding reinforcing wire but adaptable to other uses. Fully enclosed in steel water-cooled electrodes. Heat control switch. Foot pedal leaves both hands free.



UNIVERSAL CONCRETE MIXERS A real workhorse for manufacturers of concrete products. Simple, dependable. Capacities: 28, 42 and 50 cu. ft. Send for information.



Write today for details, prices.

Universal
CONCRETE MACHINERY CO.
297 South High Street Columbus, Ohio

At Last!

SUPER-SENSITIVE
TROUBLE FREE
LONG — LIVED
LOW COST

BIN LEVEL INDICATOR

made by

BUTLER BIN COMPANY

Fits any type or make of bin

For practically every material

Write for prices and details

BUTLER BIN COMPANY
987 Blackstone Ave.
Waukesha, Wisconsin

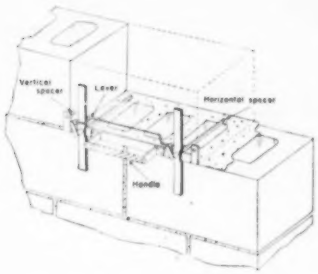
erator (except off-bearer) once controls are set, and thus makes possible the operation of an entire plant with only three men. A valve control, electric or hydraulically-powered, permits the removal of block from machine to rack, four units at a time.

For better performance and easier maintenance, the Multico Block Master is designed with a separate dust-proof steel power "pak" cabinet which houses motor controls and a hydraulic pump. The unit is a standard machine, simply designed on sound basic engineering principle, needing no special parts. It is available in two models—Model No. 2, producing two blocks per cycle, and Model No. 3, producing three blocks per cycle.

The Multico Block Machine can be installed to suit any building specifications, with either a Multiplex elevator and mixer on ground level or with gravity feed of aggregate from an overhead location. Consulting engineering advice is available at no cost to help plan or modernize a plant.

● Masonry Tool

Simplicity of use and economy of building construction are the basic features of the new "Blockguide", designed for concrete block construction. This practical tool is said to save both time and labor and enables the inexperienced worker to lay blocks as accurately as a skilled mason, the manufacturer claims. The successive blocks



may be laid with exactness while progressing from left to right or *vice versa*.

The device is placed over the foundation, mortar is spread, and the block is laid in place as shown in the illustration—outlined in relation to all adjacent placements. When the unit has been properly positioned, the operator withdraws the guide by a flick of the hand lever.

Durably made of steel, it is light enough to use with one hand. The Blockguide is made by Automatic Machine Products Co., 63 Court St., Middletown, Conn.

● Fool-Proof Calculator

A newly-developed product of Remington Rand Inc., 315 Fourth Avenue, New York 10, N. Y., the "Printing Calculator", has been designed to prepare error-free bids for the builder and contractor.

According to the manufacturer, the chief advantage of the calculator, which provides printed proof of accuracy, is to eliminate many inaccuracies unavoidable in other methods. An example of the usefulness of this machine is a "problem" cited in Remington's booklet on the device: "Find the number of 12-in. concrete blocks required in the cellar foundation walls shown at the left." By means of the printed figures on the tape the steps of the calculation show "error-free" figuring and an accurate answer.

The Tullahoma Concrete Pipe Company, Tullahoma, Tenn., has begun production at its newly constructed plant in that city. Daily capacity of the plant is 7,000 lightweight concrete building blocks and 1,250 to 2,400 lineal feet of concrete pipe. The new plant is located on a 28-acre tract on the Tullahoma-Manchester Highway.

Hydro-Forged Stone Associates, Inc., 434 Bulkley Building, Cleveland, O., is prepared to grant franchises throughout the United States on its machines for manufacturing patented blocks. The equipment will become the property of the owner, and his territory will be on an exclusive basis.

UNIT
½ and ¾ YARD
EXCAVATORS
CRANES
UP TO 15 TONS
Fully Convertible
UNIT
BUILT FOR
ALL-AROUND
Heavy-Duty Service
UNIT is tough! UNIT is versatile! That's why you can use UNIT on any type of job requiring shovel, clamshell, magnet, dragline, trenchoe, grapple or backfiller. And it's easy to change from one attachment to the other, right on the job. UNIT gives you all the power and speed you need, plus these exclusive features: Automatic traction brakes . . . Disc-type clutches . . . Drop forged alloy steel gears...Splined shafts...One-piece cast gear case . . . Straight-line engine mounting.
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More Blocks Handled

...WITH LESS BREAKAGE
...FOR LESS MONEY

WHEN YOU 'MOVE THEM' WITH A YALE

You can't blame building block manufacturers for changing their handling methods once they've found out the many advantages of using Yale power instead of manpower.

For instead of many men spending days handling and rehandling a block at a time, one man and a Yale Truck can handle tons of blocks per day . . . and do the job faster, easier, safer and with far less breakage.

Get complete details of how Yale Trucks can cut your block-handling costs in molding department, curing chambers and in storage. Send today for the Yale Building Block Bulletin—P-885. Address: The Yale & Towne Manufacturing Co., Dept. M-15, Philadelphia 15, Pennsylvania.

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FIRST WITH GREATER PAYLOAD... Challenge Mixers are carefully engineered to withstand the wear and tear of today's ready-mixed concrete operation, yet sufficiently light in weight to legally carry a greater payload. They are 1500 to 3000 pounds lighter than other mixers of equal capacity.

FIRST "5 YARD" OPEN END MIXER to charge and discharge concrete at high speed. All size Challenge Mixers will charge dry material at the rate of 10-15 seconds per yard, and discharge 4" slump concrete at approximately 15 seconds per yard... slightly longer for 1" slump concrete.

FIRST IN LOW INITIAL COST... without sacrificing quality. Elimination of all unnecessary heavy steel platforms, guards, discharge gates, etc., together with use of standard, industrial automotive equipment and mass production methods of manufacture have reduced the initial cost many hundreds of dollars. The drum and mixing blades are made of "Cor-Ten," high tensile steel which give longer, more economical mixing performance.

FIRST IN LOW MAINTENANCE COST... Ford heavy duty, industrial engine, clutch, transmission and universal joint; and Link Belt Worm Drive are standard on all Challenge Mixers... parts and repair items are available through local dealers everywhere. Elimination of the drum seal eliminates the greatest single maintenance and expense item. Complete and thorough maintenance on Challenge Mixers is reduced to absolute minimum... only 4 conveniently located Zerk grease fittings are required for weekly lubrication.

* Challenge Mixers have been in continuous use for more than 3 years on all type rugged construction projects throughout the eleven western states. Tests by leading testing laboratories show that concrete mixed in the Challenge comes well within the ASTM (American Society of Testing Materials) Specifications. Each mixer has a guaranteed, rated capacity stamped on the nameplate.

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Send me information on CHALLENGE MIXERS, including sizes, construction details, and prices delivered in my area.

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COMPANY _____

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CITY _____ STATE _____

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EQUIPMENT COMPANY

EXCLUSIVE NATIONAL DISTRIBUTORS FOR **CHALLENGE** the modern, streamlined truck mixer

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Announcing the entirely new HYSTER 20

better in every way...

- **NEW** improved Wisconsin *Air Cooled Engine.* Efficient in *any temperature,* high or low. Greater H.P. than other 2000 pound trucks. Power to spare yet *cheaper to run.*
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- **PNEUMATIC TIRES** — Big diameter, 10-ply rating (6.00x9).
- **SINGLE LEVER CONTROL** — one lever for hoisting, tilting.
- **LOW OVERALL HEIGHT** — truck with 9-foot lift only 78½ inches high. Other lift heights available.
- **EXTREMELY LOW OPERATING COSTS.** Almost 100 *new* mechanical improvements.

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the first completely modern 2000 pound Lift Truck

Designed by Materials Handling Engineers. Priced right, low maintenance costs, standardized repair procedures, low depreciation.

Operates equally as well inside or outside your plant. Low center of gravity, better visibility; EASIER ON FLOOR SURFACES, THE OPERATOR, AND ON LOADS.

THOUSANDS of HYSTER 20 trucks are in use in HUNDREDS of INDUSTRIES. NOW the New Hyster 20 Lift Truck can cut materials handling costs even more. SEE IT at your nearest HYSTER DISTRIBUTOR. While you are there, inspect his SERVICE facilities.

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Advertising rate per issue: $10.00 a column inch. 10% discount for 4 consecutive issues. (Lower rates on a contract basis.) Advertisements received by July 17, will appear in the August issue.

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"APPLEY" LITTLE GIANT VIBRATING BLOCK MACHINE WITH (2) ATTACHMENTS FOR MAKING (2) DIFFERENT SIZES OF BLOCK, MOTOR, FEED DRAWER AND STRIPPING MECHANISM ARE INCLUDED AND WE PREPAY THE FREIGHT CHARGES TO YOU.

As dealers in new and used machinery we always recondition our used machines before we ship them.

There are 2200 pallets that came with the machine, and they must be purchased by the taker.

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1—Jackson portable power plant, 110 volt, 3-phase, 60 cycle, rubber mtg. $470.00
1—Jackson Hydraulic Vibrator, 2¼" head, 34 ft. hose, rubber mtg..$430.00
1—Jackson electric flexible shaft (7'-14') Vibrator, 1—13/16" head, 25' motor lead cable, Westinghouse Motor $200.00

All the above is new equipment—not war surplus.

WESTERN EQUIPMENT & SUPPLY CO.
2221-2223 Eleventh St. Rock Island, Ill.

PRICED TO SELL

MULTIPLEX MULTICO BLOCK MACHINE

Makes two 8" at a time on plain pallet.
Have 4", 6", 8", 10", 12" & chimney block attachments. 1500 plain steel pallets.
Used only 3 months—installing larger machinery.
In operation until August 1, 1950
Make us an offer

CURTIS M. FIGG
210 N. Fifth Niles, Mich.
Phones: 1942
3140J3

FOR SALE

One—K 3 Besser Block Machine
Rock Face attachments
8", 6", 12" attachments. 1650 8" Pallets
1000 12" Pallets
Bullnose sash corner pilaster in 8" 12" roved block attachments.
Case Stationary Engine & all alignment shafts.
Also extra parts—Priced at $3500.00
Write Box No. C 4 c/o Pit & Quarry
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Both McCracken Type and Martin Trowelers—PROVED to last as long or longer — yet cost considerably less. Write for prices.

TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE

Pallets: 3" (3 core), 3⅝" (3 core, new 1947), 3⅞" (3 core, old), 5¾" (2 core plus center, some new 1947), 7⅝" (2 core, new 1947), 8" (3 core) for 15⅝" length Also: #9 Joltcrete mold boxes for above; parts enough to rebuild several #9 Joltcretes; New Holland Hammermill, plus patterns for replacement, including rolls.

PRE-SHRUNK MASONRY SALES CORPORATION
P. O. Box 838 Roanoke 4, Va.

FOR SALE

1—Stearns Clipper Stripper Hammer Machine, Serial No. C-151 with approximately 3000 pallets.
1—Besser Vibrator Plain Pallet Stripper No. MV 102 with approximately 2400 pallets, hoist and bucket and 18 c.f. mixer.
1—Light 2 roll cinder crusher and 5 H.P. motor.
1—Yale-Harsoner Lift Truck, model M 4w6-48 4000 lbs. capacity with charger but without batteries.

Subject to prior sale.

CONCRETE CONSTRUCTION COMPANY
Box 1787
Boise, Idaho

FOR SALE

CONCRETE BLOCK PLANT consisting of one 7/9 Stearns Jotterete 4", 8", 12" mold boxes with pallets, racks, lift truck; now in full operation in Miami and making profit. Entire equipment inventory, including building at $45,000.00. Terms to responsible party. **Llewellyn Machinery Corp., P. O. Drawer 2589, Miami, Florida.**

For Sale

1—Besser Super K-3 Block Machine & attachments. 760 Steel Plain Pallets.
1—Multiplex 27 cu. ft. Batch Mixer with Ball Bearing Motor & V Belt Drive.
All in A-1 shape at great sacrifice!

Friendship Block & Brick Co.
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AUTOMATIC AGGREGATE FEEDER
FOR CHAMPION DRAIN TILE MACHINE

Adaptable for 3" up to 12" tile completely automatic, fully adjusted, save labor, increase production, will pay for itself in two months.

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Write for samples and prices of "LANSCO" CEMENT COLORS in bright shades of RED, YELLOW, GREEN, BLUE, BLACK, BROWN. Manufactured by

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UNBREAKABLE PALLET RINGS

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LUFKIN, TEXAS

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All shades and grades the highest quality.
Write for color cards, prices and samples

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Established 1885

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Going four unit transit mix concrete business in small mid-western industrial city.

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4—48" and 5—42" hand cast forms 4' lengths complete with headers and two pallet rings each now making tested pipe.
One Jackson Vibrator good as new less than 50% of cost.
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"Fine Because of Their Fineness"
Ask for samples and recommendations.
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400 Block per hour, Rebuilt like new, GEORGE Hydraulic **Pressure and Vibration** Block Machines. $3150.00 f.o.b. Orlando, Florida.

Contact Dept. "F", F. C. GEORGE MACHINE CO., 100 S. Westmoreland Drive, Orlando, Florida.

FOR SALE

Priced for quick sale
5 Clark Platform Lift Trucks
Model A

Nieb Concrete Products
U.S. 31 and Fort St. Niles, Michigan

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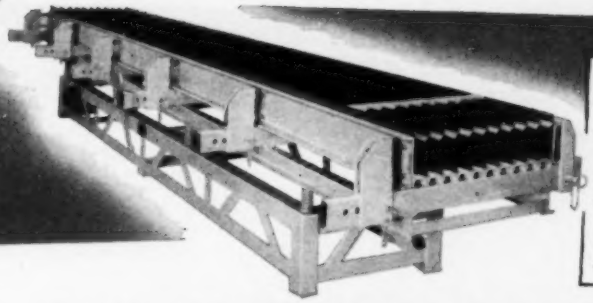
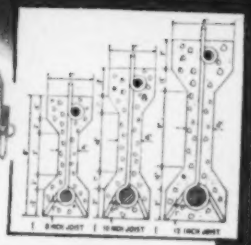
If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to

Research Dept.
C/O The Concrete Manufacturer
538 S. Clark St. Chicago 5, Illinois





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Only small investment required!

The addition of the Kirk & Blum Vibrating Table to your present equipment requires a very small initial cost, enables you to make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

Produce money-making concrete joists with the Kirk & Blum Heavy Duty Vibrating Table . . .

Cash in on the ever-growing demand for steel-reinforced concrete joists. Your experience and contacts in the building trade should make it easy to build up a profitable business in this new line. Concrete joists are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 2912 Spring Grove Ave., Cincinnati 25, Ohio.

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Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road.

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55 STEEL RACKS—For use with air offbearer. Each $15.00

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2—STEARNS CLIPPER STRIPPER Block Machines. Each..... $750.00

2—STEARNS 28 CU. FT. MIXERS Complete. Each $995.00

30,000 Pressed Steel Pallets, all sizes —send tracing for estimate.

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Bonded Scale CRUSHER, cost us $685. Capacity 25 yards per Hour. Only used one month. Price $315.00 with motor F.O.B. Telephone 29641.

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LAKE CITY, TENNESSEE

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A NO. 7 JOLTCRETE BLOCK MACHINE
STATE CONDITION AND PRICE

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FOR SALE

Pack-crete block machine less than 1 year old, including 8" mold boxes. Cost $2,700. Sale price $1,000.

Several used Stearns Clippers—7 & 9 Stearns Joltcretes.

Several thousand used pallets 4", 8", & 12".

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Complete ready-mix concrete business well established and in operation. Services a section in eastern Pennsylvania of approximately 200,000 population. 300 cu. yd. daily capacity. Equipment, plant, and trucks in excellent shape.

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18 years experience selling concrete products and building supplies for three types of plants.

Box No. C 2, c/o Pit & Quarry Publications
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FOR SALE

One Lith-I-Block Machine—automatic—modernized—8 blocks per minute.

One 25 ft. Besser Mixer with new blades and liners.

One conveyor.

Attachments for making the following blocks:

8x8x16, 3 cell	4x8x16½ high
8x8x16, 2 cell	8x12x16
Column	8x8x8
8x8x16 Beam block	8x8x8 Sash
8x4x16 Partition	8x8x16 Sash
	Cement brick

One spare 8" mold box complete.

All the above equipment is in very good condition and may be seen in operation until about August 15 when we are planning to install a larger plant. Total price $6500.00 cash.

2500 18x18x¾ steel pallets at $1.00 each. All or any part of these will be sold with the above machinery.

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CONCRETE PIPE MACHINES

The Plant behind the Product...

Write *today* for complete information on Dixon Model "C" Concrete Pipe Machines and associated equipment.

Quick delivery of precision-made Dixon Concrete Pipe Machines, and *immediate* delivery of all wearing parts, is assured by the facilities in this modern, fully equipped plant.

All machines are thoroughly tested before delivery; wearing parts are precision-machined, gauged and held to close tolerances for quick, easy interchangeability.

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Manufacturers of:

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Pipe Bend Machines
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PRASCHAK MACHINE CO.

MARSHFIELD WISCONSIN

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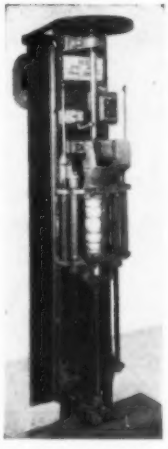
An Entirely NEW - Completely DIFFERENT CONCRETE DRAIN TILE MACHINE

EASY TO OPERATE
LOW MAINTENANCE COST
NO GEARS NO CAMS
NO CLUTCH



The ACE is the concrete drain tile machine you have been looking for. Developed after an extensive survey to determine what concrete products men wanted in a drain tile machine, the ACE features a Packer-type combination head and shoes cast in one piece to assure a perfect tile.

GE or Westinghouse 1200 RPM Ball-bearing motor and Stop and Go switch. Finest quality air cylinder, oversize, positive action, precision mounted, heavy-duty construction throughout. Just push the switch, apply the air control valve and the ACE is working for you making a product you'll be proud to sell.

With 2,000 drain tile a day made on the ACE placed on your yard at less than 3½ cents each—now check with the sales price of Concrete Drain Tile in your territory. Then figure your profit—do this today.

WRITE, PHONE OR WIRE FOR DETAILED INFORMATION

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Portland Cement

Use Trinity—the *whitest* white cement. A true portland cement that meets ASTM and Federal specifications. Trinity is first choice for architectural concrete units, terrazzo, stucco, paint and other uses. Regularly advertised to architects and other factors in the industry. Gives a purer white and truer colors when pigments are added. Ask for Trinity White. Trinity Division. General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles.

as white as snow

TRINITY WHITE
is a
True Portland Cement!

Different... Sensational... **WORK THE FIRST DAY AND THEREAFTER**

$4300.00! HOW CAN SO LITTLE MONEY BUY SO MUCH! **400 BLOCKS PER HOUR**

VAN-U-MATIC BLOCKMAKER

VAN-U-MATIC has ALL the features . . . Pneumatic power operation, vibration and off-bearer . . . Plain pallets (⅓ usual pallet investment) . . . Makes all size blocks, 16" or 18" length . . . Quick, easy changeover . . . True dimensional, Perfect blocks . . . Compact, easy to install and clean . . . We can finance.

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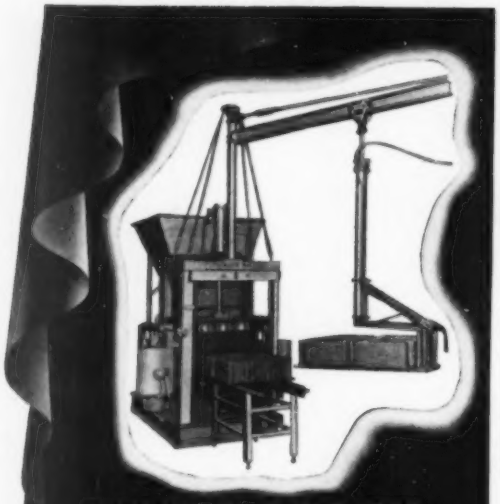

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A TWO OR THREE-BLOCK PLAIN PALLET AUTOMATIC MACHINE

FEW MOVING PARTS — LOW MAINTENANCE — DEPENDABLE OUTPUT OF 8 OR 12 PRECISION BLOCK PER MINUTE

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RED
YELLOW BLUE
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BLACK

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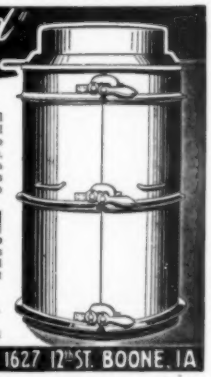
The "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY-DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

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and handling equipment are preferred by large precast tank manufacturers because they use

MINIMUM TIME and LABOR in

Pouring
Stripping
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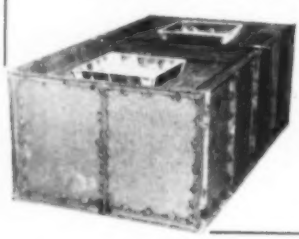
Resetting forms
Pouring again



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A little simple addition will save you money on your cinder aggregates. To the first cost of the unprocessed cinders add all the expenses you incur in making them hopper-ready. Add the cost involved in locating a satisfactory deposit, hauling expenses, interest on your processing equipment investment, equipment maintenance, paper work and all incidental expenses involved . . . to find out what your aggregate costs actually are.

Now **compare** the hopper-ready cost of your aggregates with that of our quality prepared aggregates. In most instances it will be discovered you can obtain our quality product for less.

But that's not all! Consider the other important advantages of obtaining aggregates from us. Let's start with quality because it reflects in the ultimate cost and salability of each block. Miller's aggregates are processed from carefully selected cinders that are tested to make sure stain causative agents and combustible materials contents are at a harmless minimum. Processing is thorough—the aggregates are screened, sized and mixed to provide a product that is easy to use and produces uniform, top quality blocks consistently.

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Don't overlook the value of a dependable source! Idle equipment and labor make no profits. When you order Miller's cinders you can be sure of a constant supply of hopper-ready aggregates. We have four plants to fill your needs—to keep your plant producing.

Compare the actual cost of your present cinders with that of Miller's hopper-ready aggregates . . . consider the quality . . . consider the value of a dependable source and you will follow the lead of many other successful block manufacturers in ordering quality **prepared** hopper-ready aggregates from Miller's. Contact us today for complete information.

WRITE US NOW — MENTION RAILROAD DELIVERY

H. HESSEY MILLER, Chester, Pa.

FMC 100 **BLOCK MACHINES** FMC 180

SKIP HOISTS • ELEVATORS • MIXERS

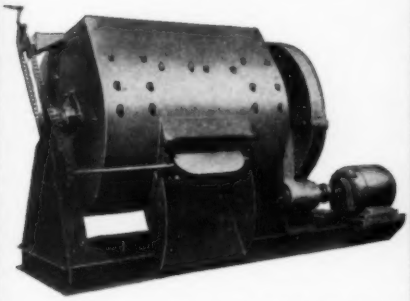
MATERIAL HOPPERS • RACKS • LIFT TRUCKS

THE FMC-24

supplied as

2 sack Standard Model **3 sack DeLuxe Model**

PLANT MIXER



Priced as a TWO sack Mixer with THREE sack Drum and Gear Reduction Capacity.

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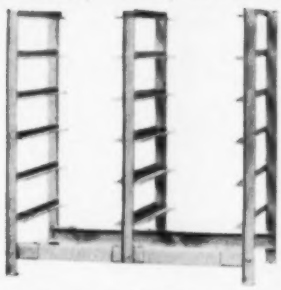
CHASE BLOCK RACKS, CARS, PALLETS

Corrosion-Resistant Hi-Strength Alloy Steel



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Sturdy construction
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any style or capacity
•
Shipped knocked down
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Rigid Field connections
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assembled Easily

CHASE Foundry & Mfg. Co.

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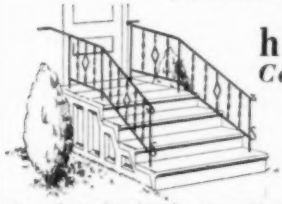
An easy climb to EXTRA PROFITS

for Concrete Producers licensed to make



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Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open. If you wish to have one of our field representatives contact you, write

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THE MARVEL JR. — DRAIN TILE MACHINE

Included on the Marvel Jr. are numerous Pats. Pend. features of our Marvel Automatic. Now, no expensive, heavy, clumsy, in-the-way stationary machine is required.

MARVEL JR. is fast. Mounted on casters. Tile are off-beared directly onto the floor and machine pushed forward as necessary. Save steps! Speed production!

The Marvel Jr. with standard equipment makes 4-inch round drain tile. Attachments can be secured for making 3", 5", and 6" round drain tile and also 4" Hexagon shape drain tile.

We are also the largest manufacturer of SPECIALTY MOLDS for making lawn, garden, porch and other concrete ornamentals.

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in your plant increases your profit by at least sixty dollars per day.

Every 100 days you operate your Besser Vibrapac you pay for OSWALT SERVICE in other ways, without having its benefits.

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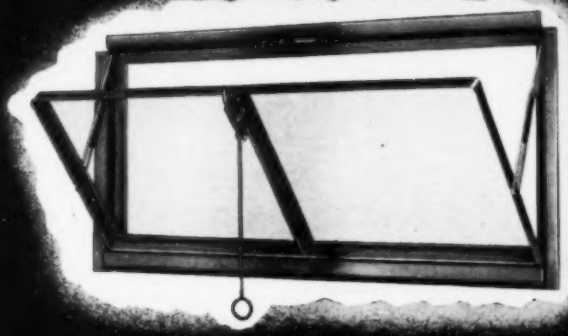
Builders Like 'em and Buy 'em

Because THEY'RE PRACTICAL!



COPCO STEEL BASEMENT WINDOWS

All features of the Copco Steel Basement Window have been developed to appeal to the builder desiring a better window . . . one that is easy and economical to install.

It pays to stock Copco—preferred by the Better Builder.

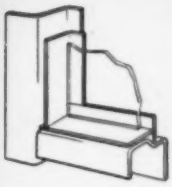
AVAILABLE IN 3 STANDARD SIZES:

Glass Size	Masonry Opening	Overall Size	Weight
2 Light 15" x 12"	32⅞" x 14¾"	33⅛" x 15¼"	13½ lbs.
2 Light 15" x 16"	32⅞" x 18¾"	33⅛" x 19¼"	15 lbs.
2 Light 15" x 20"	32⅞" x 22¾"	33⅛" x 23¼"	17 lbs.

PROMPT DELIVERIES NOW BEING MADE
ON ALL COPCO STEEL BUILDING PRODUCTS

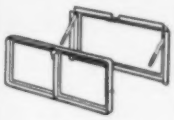
BRANCHES: NEWARK, N. J. • MIAMI, FLA.
CHICAGO, ILL. • DALLAS, TEXAS

Copco
STEEL AND ENGINEERING CO. • 14035 GRAND RIVER AVENUE, DETROIT 27, MICHIGAN



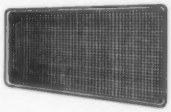
Weathertite Construction
—made of top quality heavy gauge steel . . . corners welded . . . accurate fit between ventilator and frame assure a weathertite and vermin-proof fit.

Easy Installation
Wide anchor strips on each side provide neat and positive anchoring in either masonry or block construction.



Off The Job Glazing
All vent sections are interchangeable and easily removed for "off the job" glazing.

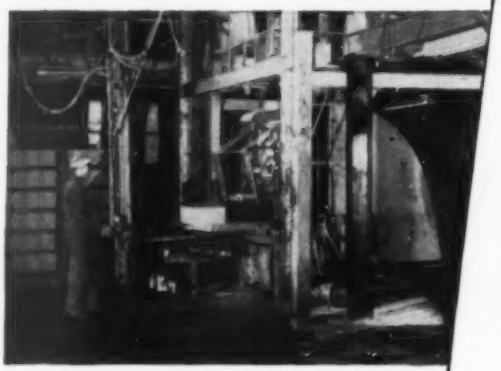
Floor Level Opening
Positive action spring lock with convenient wire pull rod provides for easy opening while standing on the floor—even in high basements.



Screens
Sturdy screens are available . . . quick and easy to install . . . interchangeable . . . not necessary to mark for storage.

STEARNS 15

The record speaks for itself!



MAKERS OF CINDER BLOCKS — EXCAVATING — SAND AND GRAVEL

E. DE VRIES

1400 WALKER ST., N. W. PHONE 7-2384

GRAND RAPIDS 4, MICHIGAN

December 17, 1949.

Stearns Manufacturing Company,
Adrian,
Michigan.

Gentlemen:

It is now over three months ago since we began operating our new STEARNS No. 15 Block Machine. During that time we have had a good opportunity to discover its production capacity, and its working efficiency. During this time we have produced almost 400,000 eight inch cement and cinder blocks, or their equivalent. Considering that this has been done with the use of only one operator, working one shift, five days a week, we believe that this is a pretty good production record.

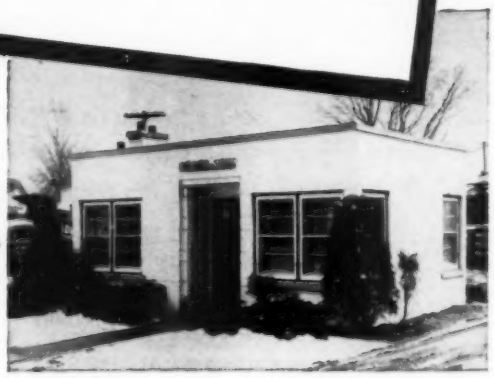
We thought you might like to know that the record of the machine has verified all the claims which your representative, Mr. Rowell, made for it.

Very truly yours,
E. DE VRIES AND SONS,

Per: Nicholas De Vries

Here is the completely automatic, new Stearns 15 Concrete Block Machine Nick De Vries, manager of E. De Vries and Sons, writes about, working smoothly, efficiently, profitably, with *but one operator* in the Grand Rapids, Michigan, plant. Utilizing Stearns' startling innovation in concrete and cinder block manufacture—the new, Dual-Shaft, Unidirectional, Vibrating Unit, now a part of all Stearns vibrating equipment—this far-famed machine is *replacing two others of lower production rates* in a continuing program of modernization and expansion.

The modern, cinder block office of E. De Vries and Sons at 1400 Walker Avenue, N. W., Grand Rapids, Michigan—a perfect match for the plant! Thirty-three-year-old pioneers in the Western Michigan Building Industry, first and largest manufacturer of cinder blocks and largest producer of brick mortar sand in its area, the De Vries concern today extends over eight and one half acres.



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STEARNS 15

STEARNS 50

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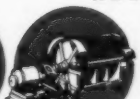
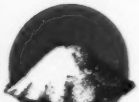

MIXERS

SKIP LOADERS

TURNTABLES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use Hendrick Perforated Plate on vibrating and shaking screens . . . maintains uniformity of mesh throughout an unusually long service life . . . material is always correctly sized . . . full clearance minimizes loss of time from clogging . . . ease with which decks can be changed reduces labor costs.

Furnished either flat or corrugated . . . with any required shape and size of perforations . . . in tank, high carbon, high tensile and abrasion-resisting steels . . . for highly abrasive material it is heat-treated to increase its toughness.

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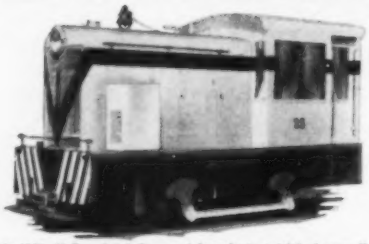

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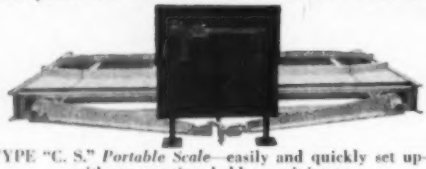

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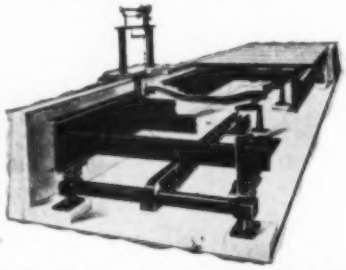

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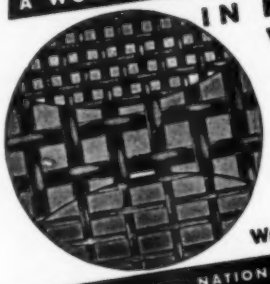

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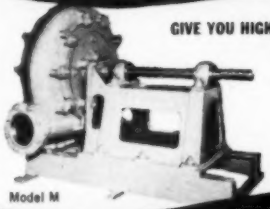

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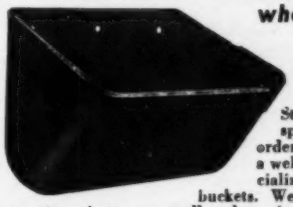

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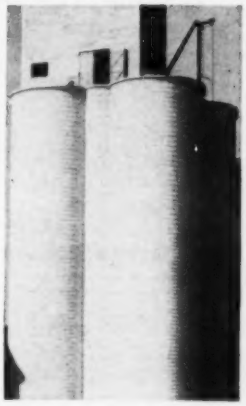

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20"	5	1/8"	1/32"
24"	4	1/8"	1/32"
24"	5	1/8"	1/32"
26"	5	1/8"	1/32"
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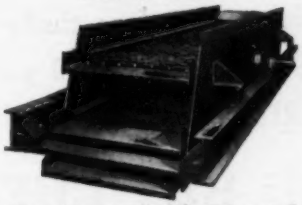
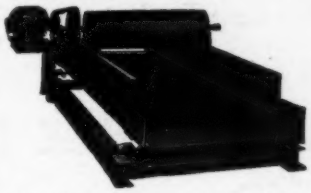


Heavy duty eccentric shaft types. 1 to 5 decks; screen sizes to 5x14. Priced from $1350 including cloth or plate.



Eccentric weight type screens. 1 to 3 decks; sizes to 3'x8'. Including cloth or plates, from $395.00.

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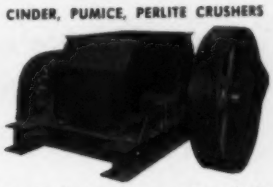

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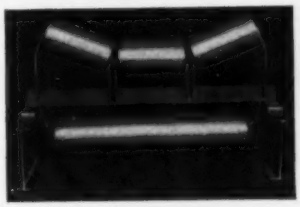

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1—Deck hoist
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1. NEW ⅜ Yd. Crane, Shovel Dragline, truck mounted. Powered with 4 Cyl. "Le Roi" Gas Engine. Special Built from the latest power shovel design. Fast . . . Maneuverable . . . Ideal for Contractors, etc. . . With or without truck.

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Real Bargains—Will Sacrifice for Quick Sale.

BAUGHMAN MFG. CO., INC.
Jerseyville, Illinois

CARLYLE

INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FIRE, WATER, SUCTION, AIR, STEAM AND WELD END HOSE

SUCTION HOSE

Stock No. CO-343B

Heavy-duty, smooth bore, wire inserted Suction Hose. Flexible and strong. For use in mines, sewers, trenches, etc. with diaphragm pumps, pressure pumps and other contractors equipment. Prices shown include I.P.T. Couplings attached to each length.

I. D. Size and Length	Price Per Length	I. D. Size and Length	Price Per Length
1½"x10 ft.	$ 3.25√	2½"x10 ft.	$10.00√
1½"x20 ft.	5.75√	3"x15 ft.	29.50
1½"x10 ft.	4.00√	3"x10 ft.	38.50
1½"x15 ft.	6.00√	4"x10 ft.	20.00√
1½"x20 ft.	8.00√	4"x20 ft.	53.75
2"x10 ft.	6.50√	*5"x15 ft.	35.00√
2"x15 ft.	18.75	*5"x30 ft.	57.50√
2"x20 ft.	24.25	*I. P. T. Couplings	Nipples or attached.

DISCHARGE HOSE

Stock No. CO-342B

Cotton jacket, rubber lined hose suitable for water supply and discharge service. Constructed exactly like Fire Department hose. Light in weight. For pressures to 200 lbs. Attached to each length are Iron Pipe Thread couplings.

Inside Diameter	Price Per 25 Ft. Length	Price Per 35 Ft. Length	Price Per 50 Ft. Length
1½"	$ 6.00√	$ 8.00√	$10.00
2"	13.00	17.40	24.00
2½"	11.50√	15.00√	20.00
4"	16.00√	20.00√	29.00√

HIGH PRESSURE HOSE

Stock No. CO-88B

2½" x 8 PLY DUCK AND CORD CONSTRUCTION SUITABLE FOR 400 LBS. WORKING PRESSURE

For that difficult job where high pressures are encountered Carlyle offers this rugged flexible hose saving you over 50% in cost and giving dependable service for the following jobs—

- * Jetting—Water, Air, Cement
- * Hydraulic Grout
- * Steam to 100 lbs. Pressure
- * Oil Discharge

Low Priced at..... 75c ft.√

Available in 10-15-20-25-30-50 ft. lengths. High Pressure Couplings attached as follows:

		Per Set
Male & Male.....	2½" I.P.T....	$10.00
Female & Male....	2½" I.P.T....	12.00
Female & Female...	2½" I.P.T....	16.00

COMPRESSOR AIR HOSE

Stock No. CO-341B

250 Lbs. Working Pressure. Heavy-duty extremely flexible. Pneumatic Air Hose. For all Air Tools, Compressors, Chippers, Riveters, Drills and Breakers. Each length complete with Universal Air Hose Couplings attached. These couplings are quick snap and interchangeable with Air King, Chicago, Cleveland and others.

I.D. Size and Length	Price Per Length
½"x25 ft.	$ 7.25
½"x50 ft.	13.00
¾"x25 ft.	8.75
¾"x50 ft.	16.00
1"x25 ft.	10.50
1"x50 ft.	19.50

√—*over stocked. Drastically reduced prices to move.*

Terms: f.o.b. — N. Y. City — 2% —10 days.

CARLYLE RUBBER CO., Inc.
62-66 Park Place, New York 7, N. Y.
Phone: Digby 9-3810

FOR SALE

Shovels, Cranes

1½ Yd. Model 6 Northwest G.M. Diesel Motor $12,000.00
1½ Yd. Model 6 Northwest G.M. Diesel Motor & Dragline, Serial 134600 series Late Model Murphy Diesel..... 28,500.00
1 Yd. Osgood Crane 40' Boom 6 Cyl. Gas Motor 2,500.00
¾ Yd. Insley as Dragline or with 29" Magnet 8,500.00

Trench Machines

Barber-Greene 44A 18" x 5'6" ..... $ 1,750.00
Buckeye Wheel 18" x 6' Gas or Diesel..... 5,500.00
Buckeye C-15, 42" x 16' Gas or Diesel..... 6,800.00
Buckeye C-15, 42" x 14' Gas or Diesel..... 4,800.00

Slackline & Dragscrapers

Sauerman Two Speed Hoist with 125' Mast and 2½ Yd. Bucket D13000, Cat. Diesel Motor $12,000.00
Clyde Two Dr. Two Speed Hoist with 100 HP Int. Diesel Motor and 2 Yd. Crescent Bucket. 4,200.00
Sauerman RB Two Speed Elec. Hoist 60 HP with 1½ Yd. Dragscraper Bucket, Mast, Cables, Sheaves, Etc. 4,500.00
Two Speed Two Drum Hoist with 50 HP Waukesha Gas Motor..... 1,250.00

Pumps

F-M 8" Suct. 6" Dis. Centr for Gravel Plant Plant Elec. $650.00
F-M 5" Suct. 4" Dis. Centr for Gravel Plant Elec. 450.00
Griffin Well Point Systems Complete 8" Suct. Model 88 .....

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9" x 36" Universal Roller Bearing Jaw.... $2,200.00
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85' Boom, 45' Mast Steel Stiffleg Derrick 2,800.00
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International UD18 with 60 KW A.C. Gen. unit complete 1,000.00
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¾ Yd. Henry Clamshell Good as New Rehandling 700.00
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Int. TD 9 Diesel Hilift, 8' Blade, & Logging Arms 3,800.00

We have Equipment of All Kinds. Let US know what you want to Buy. We BUY GOOD Used Equipment. Send us a list with Prices of what YOU want to SELL.

The T. J. Lane Co.
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Dial 2-3362 — 3-3761

BUY "BRILL"

1—Allis Chalmers 9'x80' Rotary Kiln.
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1—Bonnot 3'x35' Rotary Cooler.
1—Williams 4-roll "Comet" High Side Mill.
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4—Tyler Hummer Screens, 3'x5', 4'x5', 4'x10'.
1—Jeffrey 30"x24" Type A Hammer Mill with 50 HP motor.
2—Jeffrey 32"x60" Type B Hammer Mills.
1—Williams No. 1 Slugger with 30 HP motor.
2—Williams No. 5, No. 4 Jumbo Hammer Mill.
1—Patterson 3'x10' Continuous Ball Mill with air separator.
1—Hardinge 5'x22" Ball Mill with 30 HP motor and Classifier.
1—Bonnot 5'x22' silex-lined Tube Mill with 150 HP motor.
1—Marcy 7'x16' Rod Mill with 200 HP motor.
1—10"x18" Jaw Crusher with 7½ HP motor.

Partial List—Send for News Flash

BRILL EQUIPMENT COMPANY
2401 Third Ave. New York 51, N. Y.

BELT CONVEYORS FOR SALE

1—42" x 450' Robins Belt Conveyor with Robins anti-friction troughing and return idlers with dual drive gear reducer and 75 H.P. A.C. motor.
1—42" x 125' Robins Conveyor, same specifications

Please send for details and low price.

CONSOLIDATED PRODUCTS CO., INC.
17-19 Park Row New York 7, N. Y.
Phone: BArclay 7-0600

Jaw Crushers: 48x60, 40x48, 30x36, 25x40, 15x36. Rotary dryers, 6'5"x60', direct; 6'x40' indirect. Euclid 15-ton rear dumps; Athey 12-yd. wagons. Butler-Heltzel concrete batching plant, 3-yd. Shovels, Draglines: Manitowoc 3900, 2000B; Lima 1201, 802; Marion 40A; Bucyrus 120B, 48B, GA-3; Northwest 76, 80D; Link-Belt K-45, etc. Truck mixers, 2-yd., Blaw-Knox, Jaeger (5). Diesel-electric generators (5), 100 to 1000 KW. Locomotives, 7—68 tons, diesel, gas, steam. B-Erie 2 1/3 yd. shovel attachment, 52B-55B.

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SAUERMAN 1½ CUBIC YARD LIGHT WEIGHT CRESCENT SCRAPER WITH BLADE, CHAIN AND TEETH. NEVER BEEN USED. PRICE—$400.00

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STEAM LOCOMOTIVE — "Porter." 10x16—18½ Ton. 36 Inch gauge. Saddle tank. High pressure boiler. Good condition. Make offer. **BESSEMER LOAM-SAND CO., OAKMONT, PA.**

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¾ yd. P & H Crane—Model 206
40 ft. Boom—good condition
Will price to sell

CHILLICOTHE GRAVEL CO.
Chillicothe Illinois

FOR SALE

1—Jeffrey 20" hammermill, 1 yr. old. Crushed less than 4000 tons.
1—38" Gruendler Soft Stone eliminator. Good condition. Bargain price.

Bradford Machinery Co.
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Phone: Kingswood 2920

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2½ YARD, HI-LIFT SHOVEL ATTACHMENT FOR MARION 392. WILL FIT SEVERAL OTHER MACHINES. EXCELLENT CONDITION. PRICED FOR QUICK SALE.

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REVOLVING SCREEN

Universal, 16 ft. long x 30 in. dia. revolving screen, less power and drive; punched for 1¾ in., ⅝ in., ½ in., ¼ in. size, with chip or dust jacket, open end for ballast. Price $900.

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If you are capable of managing an Engineering Department and can handle new development work in heavy construction equipment, this position will pay you well. State education, experience, salary expected, and other pertinent facts. Our employees know of this ad. All replies confidential.

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Construction, machinery installation or operation of cement plant. 25 years experience in United States and Latin America. Available immediately.

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FOR SALE

USED EQUIPMENT

1 Pioneer 4x12 triple deck vibrator
1 Lippmann 42x24 roller bearing roll crusher
1 Lippmann 32x24 hammermill

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HOISTS - PUMPS - MINE LOCOMOTIVES - CONTROLS - REPAIRS

FOR SALE:

(1) Schramm Model 315 Diesel driven compressor mounted on (4) pneumatic tires, complete with 2-hose reels, fully automatic electric starting and receiver-clutch, etc.

(1) Cleveland Wagon Drill MD R 30 mounted on pneumatic tires.

Both units were operated very little and can be purchased at a very considerable savings.

15x24" UNIVERSAL Jaw Crusher
6'x40' Louisville Dryer
9'x36" C. R. Crushing & Screening Plant
Super C. Tournapull Diesel & Scraper
D-8 & D-7 Caterpiller Tractors
18,000 Gal. Welded Steel Tank
100 & 125 HP Steam Generators
80, 100, 125, 150 HP Erie Economic Boilers

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RENTAL or SALE

Derricks, Hoists, Wagon Drills, Air Compressors, Drills, etc. All kinds of Construction Equipment.

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All Sizes
Track Accessories

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General Office: 212 Victor Street
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BOOM for 80D Northwest Shovel, 65' long with Bridle Blocks and Sheaves

G. & W. H. CORSON, INC.
Plymouth Meeting, Penna.

FOR SALE

1—Traylor Gyratory Crusher—Type TY—1'8" with extra set of mantles.
1—12 cu. ft. Stearns mixer
1—Dunn mixer
1—block machine

VERY GOOD CONDITION
BATTLE CREEK CONCRETE PRODUCTS CO.
Battle Creek, Michigan

FOR SALE

1—Bucyrus-Erie used 10-B shovel ¾ yd. capacity with Buda HP-260 gasoline engine with electric starter serial #18143. Good condition, reasonably priced.

STUART M. CHRISTHILF & CO., INC.
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1 Lot 3 column steam radiators, for homes $7.00 per radiator.

1	10 H.P. Single Phase Electric Motor Good Condition	$ 200.00
1	Small air cooled gas engine for paint spray gun	25.00
1	Rear mounted winch for Allis Chalmers HD-7 Tractor with oil field pipe guards All Condition	500.00
1	HD-7 Allis Chalmers Bulldozer Good Condition	3000.00
1	6 Inch Water pump like new—less motor	150.00
1	2 Inch Water pump air cooled gas engine Good Condition	150.00
	Set cleats for TD-9 International Track Pads new, each	.25
1	Large Dome Type Water heater	20.00
1	Heater Barrel Type coke Salamanders	15.00
1	7KW Generator with pulley	150.00
1	V Pulley 5 B belts 22 inch like new	20.00
1	Hercules 16 H.P. Power Plant with clutch & V Belt Pulley	150.00
1	Shaker Screen 4 x 8 Single deck	400.00

All of above in good condition.

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122 W. Gallatin Street, Vandalia, Illinois
Telephone 366

For Sale

Complete rock crushing plant

dismantled and loaded on cars 1324 Telsmith roller bearing jaw, 12x16 Eagle pulverizer, 34 ft. bucket elevator, 16 ft. elevator 36" by 16 ft. revolving screen, two 65 HP power units all guaranteed to be in good operating condition. All shafts, Sprockets, belts to make it complete as now operating. Somebodies bargain for $5,000.00.

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Agricultural lime and fluxing plant, 126 acres, well equipped, on railway. A bargain.

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BELTED: 315, 528, 676, 1000, 1200 & 1570 Ft.
ELECTRIC: 207, 1302, 1722, 2850, 3176 & 3700 Ft.
DIESEL: 105, 315, 420, 500, 603, 807 & 1000 Ft.

CRANES — DRAGLINES — SHOVELS

3—Elec. Shovels, 17, 10, 8, 4, 2 & 1 Yd.
4—Walker Draglines, 2-6-9-16 Yd.
3—25 & 40 Ton 120 Ft. Boom Whirleys.
7—Loco. Cranes 20, 25, 30 & 40 Ton Diesel & Steam.
8—Diesel Shovels & Cranes 1 to 5 Yd.

DUMP CARS

46—KOPPEL, 1½ Yd., 24 & 30 & 36 & 42 In. Ga., V Shaped.
115—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
60—Std. Ga. 12 Yd., 18 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD & TUBE MILLS

5'x22", 6'x22", 6'x48", 7'x48" & 8'x22" Hardinge Conical Ball Mills.
3'x3', 4'x5', 4'x4', 5'x4', 6'x4', 6'x6' & 7'x5' Cylindrical Ball Mills, Marcy, Allis Chalmers, etc.
3x8, 4x9, 5x12 & 7x9 Rod Mills.
5x22 & 5½x30 Tube Mills.

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6'x22" & 6'x48" Hardinge Air Classifying.
3 Roll Raymond High Side, 4 & 5 Roll Low Side.
Kent Maxecon Mill.
Nos. 11½ & 2 Sturtevant Ring Roll.
Bradley Hercules Junior.
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4', 10', 14' & 16' Air Separators, Sturtevant & Gayco.
6' x 14' Hardinge Counter Current Classifier.
24", 36", 48" & 78" Spiral Classifier.
16" x 7' Dorr Hydro Separator.
Durreo 4 Pocket Sizer & Several Rake Classifiers.

BLAST HOLE & WELL DRILLS

Bucyrus Erie 27T, 29T & 59
Loomis 44, Keystone 51 & 71
2—I. R. Quarry Master Drills
10—IR-7M2—Wagon Drills

JAW CRUSHERS

Blake Type—9x16, 10x30, 12x24, 13x24, 13x30, 18x30, 18x36, 24x36, 36x42, 40x48, 60x42, 84x60, 42x48 & 28x36
Single Shaft Type—9x16, 10x16, 11x18, 8x36, 10x30, 15x24, 13x30, 10x36, 15x36, 18x36, 20x36, 24x36, 10x40, 30x42
Cam & Roller Type—8x10, 6x20, 10x16, 10x20, 10x36, 11x18, 12x16, 12x22, 13x24, 12x20, 11x24, 11x26, 13x24, 14x26, 14x28, 15x36, 18x32, 9x40, 24x40, 22x50

REDUCTION TYPE CONE CRUSHERS

Allis Chalmers 322R Newhouse 7' & 10'
Symons 2', 3', 4' Std. 5½' Short Head Tels. Gyro 24", 36"
Traylor 1'6", 2'4" TY No. 12 BH, 36", 48" TZ
Kennedy 19-S, 25-S, 37-S, 49-S

PRIMARY TYPE GYRATORY CRUSHERS

Allis Chalmers K&N No. 3, 4, 5, 6, 7½, 8, 9, 12
Superior McCully 16", 20", 30"
Austin No. 2, 4, 105, 107, 8
Traylor Bulldog 12", 14", 16", 20", Tels. 10B, 13D

STEEL DERRICKS

GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 125 Ft. Boom.

ASPHALT & OIL TANKS

15—8000, 10000 and 20000 gal. cap. with coils.

RAILROAD CARS

100—8000 & 10,000 gal. cap. Tank Cars.
100—50 Ton & 70 Ton Battleship Gondolas.
60—50 Ton Cap. Flat Cars.
10—Side Dump covered, 70 ton Hopper Cars.

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DIESEL: 15, 30, 45, 65 & 100 Ton.
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

HAMMER MILLS

JEFFREY 30 x 24 A, 36 x 24 & 36 x 42 B
STEDMAN 20 x 12
WILLIAMS No. 15 SLUGGER
GRUENDLER 2-XB — 3-XB & 6-XC
DIXIE — 3020 MOGUL JR. & 3650 PREMIER
PENNSYLVANIA CA-3-38 & C-7-38 Impactors and SXT-11 & 15

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70" x 35' Ruggles Coles XB10 Indirect.
Double Shell: 48"x20', 80"x45', 96"x70', & 104"x85'
Direct Heat: 3'x20', 4'x40', 4½'x40', 5'x24', 5'x30', 5'x50', 6'x35', 6'x60', 80"x60', & 90"x80'
Kilns: 4½'x30', 6'x60', 7'x100', 7½'x125', 8'x125', 9'x80' & 9'x170'

CONVEYOR BELTS

6600 Ft. 36, 42, 48 & 60 In. Wide

SCREENS

VIBRATING: 3x5, 3x8, 3x5, 4x5, 4x8, 4x10, 4x12.
HUMMER, NIAGARA & ROBINS, LINK BELT.

DIESEL GENERATORS

4—100 KW G.M. 3/60/220/440 V.
2—60 KW International 3/60/220 V.
2—50 KW Superior 3/60/220 V.
3—74 KW Caterpillar 3/60/220/440 V.
1—190 KVA Baldwin DeLavergne 3/60/440 V.
1—New 600 KW American 3/60/480 V.
1—300 KW Chgo. Pneu. 3/60/2300 V.
1—300 KW F.M. 3/60/2400 V.
1—432 KVA Worthington 3/60/2300 V.
8—230 Volt Direct Current 50 to 500 KW

R. C. STANHOPE, INC.
60 E. 42nd St. — New York 17, N.Y.

SPECIAL OFFERING

1—new 18 x 32 solid steel frame style D crusher.

1—new 14 x 26 solid steel frame jaw crusher.

1—#6 McCully crusher in good running condition just taken from service.

2—6' dia. 12 x 16' long scalping screens 2¼" manganese perforations.

A number of new manganese steel screen sections for Allis Chalmers 6' revolving screens 2¼" perforations.

New and rebuilt jaw crushers in all sizes from 6 x 10 to 42 x 60.

ACME ROAD MACHINERY COMPANY — Frankfort, New York

ELECTRIC HOIST

Lidgerwood Single Drum
Equipped with 40 HP Slip Ring Motor
3/60/220 or 440 Volts
With Drum Type Controller & Resistance
Excellent condition. Attractive price.
Also Vibrating Screens, Conveyors, Coal Crushers, Car Spotters, Etc.
What Do You Need?

THE INDUSTRIAL EQUIPMENT CORP.
910 First National Bank Bldg.
Pittsburgh 22, Pa.

FOR SALE QUARRY EQUIPMENT

19—Easton Standard Phoenix Cars of 8 yds. capacity for 4'8½" gauge track, furnished complete with oak cushion and steel liner plate, side dump. Equipped with ¾ size automatic couplers and spring draft rigging and with hand wheel type brakes operating on all four wheels of car.

3—Whitcomb Gasoline Locomotives, 15 tons, class LRX-1, gauge 56½".

3—Heavy Duty Disappearing Top Barney Cars, gauge 29½".

Spare parts included for the above equipment. Above equipment in good operating condition.

THE ABOVE MAY BE INSPECTED AT BATH, PENNSYLVANIA

KEYSTONE PORTLAND CEMENT COMPANY
Bath, Pennsylvania

1948 Byers ¾ yd. shovel
Ohio 30 ton Locomotive Crane—1947
Caterpillar No. 10 Grader
Rebuilt ½ yd. P-M Digging Bucket
HD-19 Winch & Pusher Block—1948
2—DW-10 Tractors with scrapers
¾ yd. Comb. Tractor-Shovel & Dozer, Diesel, 1946—$2500.
Barber-Greene Bucket Loader—1948
20 ton Vulcan Locomotive
25 ton Plymouth Locomotive, Diesel
25 & 30 ton Locomotive Cranes
½ yd. Shovel Attach. Bucy-Erie 15B
Pullshovel Attach. for No. West 104
25 ton Industrial Loco. Crane, Gas
71W Byers Traveler, Shovel-Crane
⅜ yd. Byers Bearcat Junior Crane
2 yd. Hayward Orange Peel Bucket

J. T. WALSH
508 Brisbane Bldg. Buffalo, N. Y.

LONG BOOM DRAGLINES

P & H 775 with 80' boom, 2¾ yard dragline bucket. Atlas engine.

P & H 810 with 90' boom, 3¼ yard dragline bucket. Atlas engine.

Both in excellent condition.
Priced to Sell

NIXON MACHINERY & SUPPLY CO., INC.
1300 Carter Street
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Equipment Values!

Tractor-Dozer—Caterpillar Diesel D6, serial #4R2068SP; wide gauge, with LeTourneau straight tilt dozer, double drum PCU. Gone over, cleaned, painted. FOB Louisville. **$5750.00**

Tractor-Dozer—Caterpillar Diesel D8, serial #1H6072, w/LeTourneau 12-ft. bullbozer and LeTourneau PCU. In good operating condition. FOB Evansville. **$4250.00**

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Engine-Power Unit—Caterpillar Diesel D13000, serial #4S2759, with fan guard and safety cut-off. Completely rebuilt, and hour meter now reads 0001. A real bargain. FOB Louisville. **$4475.00**

Scraper—LeTourneau Model FP, 18-yd. A fine looking scraper, excellent tires. FOB Louisville. **$3875.00**

Mixer—Jaeger 11-EL, #90602, with Wisconsin VE-4 engine. Checked over, cleaned, painted. FOB Louisville. **$1275.00**

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WHAYNE
SUPPLY CO
800 W. MAIN ST. • LOUISVILLE KY
Evansville, Ind. Paducah, Ky.

SPECIAL BARGAINS

Barber-Greene Crawler Gas Spiral Feed Bucket Loader.
Lorain 40 Truck Crane on Mack Truck, pneumatic tires.
P&H "Model 300" Crawler Gas Backhoe, ½ yd.
Cat. D4600 Diesel Engine, never used.
The above priced to sell.

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VErmont 7-0366

FOR SALE

600 ton per hour bucket type sand and gravel dredge. Built by Dravo of Pittsburgh. Hull 155 ft. x 44 ft. x 8½ ft. Steam and diesel powered. Completely equipped with accommodations for crew. Has new dredge ladder and buckets. Last used January, 1950. Excellent condition.

Ohio River Sand Company, Inc.
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FOR SALE

90 ft. Sauerman Steel Mast, including guy cables, sheaves, blocks and etc. Good condition, purchased new and used less than 2 years.

May be seen at our plant at Michigan City, Ind.

PORTAGE-MANLEY SAND COMPANY
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Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully Guaranteed. Send us your inquiries.

V. M. NUSSBAUM & CO., Fort Wayne, Ind.

New **RAILS** *Relay*
Track Accessories — Steel Storage Tanks

W. H. DYER CO., INC.
1040-P Railway Exchange Bldg., St. Louis, Mo.
Stocks at Various Points

FOR SALE

1—PD 40 HP International Harvester Diesel, in running order.
3—Anderson 21 Oil Expellers, with or without motors, now in use for soybean processing. Sacrifice prices on this equipment. Write

EUREKA MILLING COMPANY
Roanoke, Illinois

FOR SALE

1—Blaw Knox Steel Bin 110 yds., 12' Dx25' high
1—Double chain elevator 50', 16" x 9" buckets
4—Easton V cars 2 yds. 36" gauge
1—Williams NF 40 Hammer mill with Westinghouse 125 HP dustproof motor and starter
1—Jeffrey 24" x 36" B3 Pulverizer

HERMAN A. HALL
Wyomissing, Pennsylvania

FOR SALE OR TRADE

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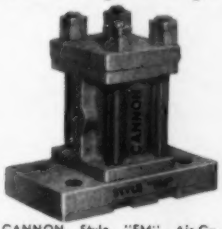

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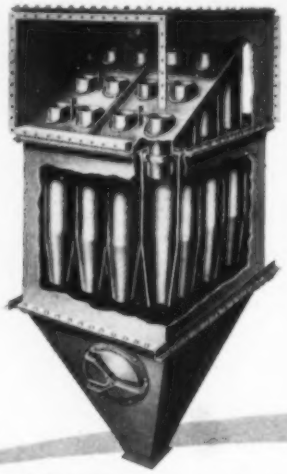

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Make	Relative Space Requirements In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

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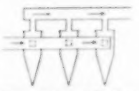
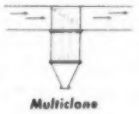
Side inlet, Side outlet *Side inlet, Top outlet*

COMPARE All-Around Simplicity!

The MULTICLONE is simple and inexpensive to maintain because there are no highspeed moving parts to repair or replace . . . no pads or filters to clean or renew . . . nothing to choke the gas flow or increase draft losses as suspended materials are recovered. In addition, the square, flat-sided shape of the MULTICLONE and its straight inlet and outlet ducts are far simpler to install and insulate. And since the recovered material from an entire bank of tubes is collected in a *single* hopper, it is much easier to service and maintain than the multiple hoppers of conventional cyclone units. *Here again, the* MULTICLONE *saves in many ways—all of them important!*



Conventional Cyclone



Multiclone

Whether your recovery installation is in a new structure or for modernizing present equipment, you will be far ahead by installing MULTICLONE Collectors. Our experienced engineers will gladly make helpful suggestions for simplifying your recovery problems. A letter, wire or call to our nearest office places this assistance at your service without obligation.

Send for Helpful Literature! This factual MULTICLONE literature explains the basic principles of cyclonic dust recovery and gives technical data helpful to anyone contemplating a dust or fly ash recovery installation. Write today for your free copy!

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1015 WEST NINTH STREET, LOS ANGELES 13, CALIFORNIA
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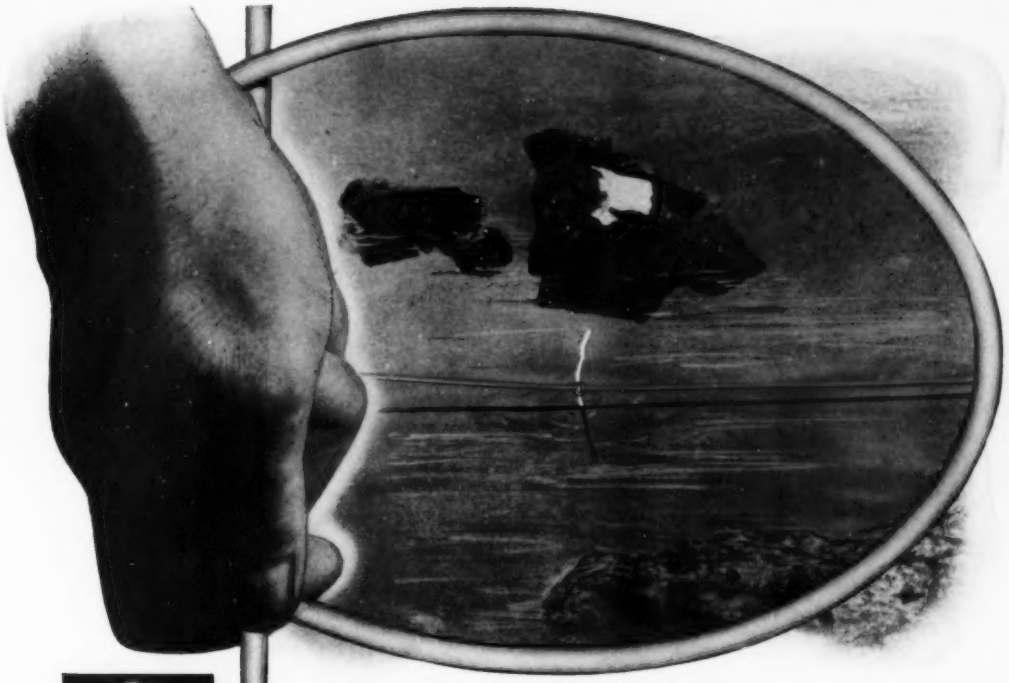


Plastic Reinforced Primacord is recommended for all "down" lines. Use Plain Primacord for surface or "ground" lines. To make the most effective hook-up, use a simple clove hitch in the *ground* line, as shown in these three photographs.

The twin loops have been folded over to form a hole.

Pass the Plastic Reinforced Primacord through this hole and draw the two ends up *tight*.

Tough going calls for

PLASTIC REINFORCED PRIMACORD

Surface water, sludge and mud need not delay your loading operations if you use the new Plastic Reinforced Primacord for the "down" lines. The seamless plastic cover is *waterproof* and resists penetration even at high pressures. It is also smooth, tough and resistant to the action of the acids commonly encountered. Sub-zero cold and high summer heat do not affect Plastic Reinforced Primacord. Its weight is about the same as Plain Primacord and its tensile strength is greater than that of Wire Countered Primacord.

Use Plastic Reinforced Primacord in deep, wet holes, in preloading, pipe line river crossing, horizontal holes, marine work, coyote tunnels and sleeper shots for seismograph work.

P-2

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

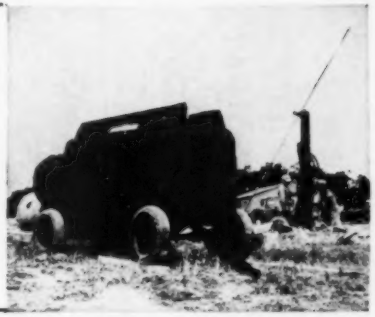
PRIMACORD-BICKFORD DETONATING FUSE • SAFETY FUSE SINCE 1836

You hear it from coast to coast.*..

"It's Blue Brutes For My Money!"

***PENNSYLVANIA**

A 315′ Portable Compressor and UMW Wagon Drill, one of many Blue Brute teams owned by Cramer Construction Co. of Lebanon, Pa. Pres. G. B. Cramer writes: **"We have used Blue Brutes for several years, and on our Lebanon Veterans' Hospital job have five Blue Brute Compressors powering Worthington Wagon Drills and Rock Hammers. As evidence of their entirely satisfactory performance we recently purchased another 315′ Blue Brute Compressor."**



***OHIO**

In Waterville, Ohio, the Crawford Steel Construction Co., Inc., of Cincinnati, erected the structural steel on the new highway bridge across the Maumee River. Company official J. A. Crawford says: **"Our 210′ Blue Brute Compressor is efficient, well constructed and rugged. It has given us excellent service, and we are more than willing to recommend it highly . . . This first experience with your products is evidence to us of Blue Brutes' superiority.**

***OREGON**

It's another Blue Brute UMW Wagon Drill. Ready to swing into action at any angle, it is here helping to cut through a road cut where the timber grows tallest. The Kuckenberg Construction Company of Portland, Ore., are the owners and the report from this firm says they **"wish all their other machines on the job were as good . . . and are going to change to Blue Brutes in future replacements."**

***WISCONSIN**

Opening up a new limestone quarry in Sussex, Wisconsin, is easy work for these rugged, hard-hitting Blue Brute team-mates. The fast, versatile UMW Wagon Drill is drilling 6-foot holes for explosive charges. Power source is a 315′ Blue Brute Compressor, that gets all the air out of every drop of fuel. Vice-President Lloyd Wolf of the Quality Limestone Corporation, reports: **"After thorough investigation we decided Worthington equipment was best . . . They are fine machines."**

From the Atlantic to the Pacific you'll find Blue Brute owners — on every type of construction project, from the smallest to the largest — glad to tell you of the cost-cutting, trouble-free performance that is helping make estimates pay handsomely.

There are a lot of sound reasons for this country-wide acclaim — all adding up to the fact that *there's more worth in Worthington*. Your nearby Worthington-Blue Brute Distributor is ready with those reasons, and can make immediate deliveries. See him, or write us direct.

Worthington Pump and Machinery Corporation
Construction Equipment Department
Harrison, New Jersey

Distributors In All Principal Cities

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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB